The Newspaper of Information Systems Management
September 19, 1994, Vol. 28, No. 38, 144 Pages, Section 1 of 2, $6/Copy, $48/Year

COMPUTERWORLD

Bank law to spur IS revamps

By Thomas Hoffman
and Mitch Betts

The U.S. Senate's approval last week of a long-awaited interstate banking bill is expected to accelerate the industry's already fast-paced merger and acquisition activity and expedite data center consolidations.

The legislation, which President Clinton is expected to sign into law shortly, would effectively remove all remaining barriers to interstate banking in the U.S. beginning late next year.

"From a systems standpoint, the biggest impact for us will be on our item processing," said Judge Fowler, senior vice president and director of systems development at First Union Corp. in Charlotte, N.C.

Fowler said the new interstate banking law — which for the first time will allow customers to make deposits to their accounts from branches in different states — will require First Union to upgrade 20 of its older IBM 3890 XP reader/sorters at an anticipated cost of

Bank law, *page 127*

NT honed for Unix fight

Microsoft partners strengthen high-end server push

By Stuart J. Johnston
and Jean S. Bozman

When Microsoft Corp. this week unveils the Daytona version of Windows NT and a slew of accompanying server and applications products, what goes unsaid may be more important than what happens onstage.

Although it never intended to keep it a secret, Microsoft has quietly assembled a panoply of partners to provide connectivity options for the Unix environments that are central to many enterprise computing networks.

While each of these alliances is important individually, when viewed in toto they add up to nothing short of an all-out assault on the bastions of Unix.

"I don't think anybody has said, 'Look how all these things add up,'" said Jesse Berst, editorial director of the "Windows Watcher" industry newsletter in Redmond, Wash.

Alliance leverage

In part, via these partnerships, Microsoft hopes Daytona — or Windows NT 3.5, which is scheduled to ship in the next few weeks — will provide a wedge to move NT into the critical high-end server market.

However, it will take more than an interim update — with features

NT, *page 16*

WINDOWS T

BackOffice, Microsoft's suite of server products for corporate users, will include four server applications that run on NT Advanced Server. The package will debut at Networks Expo this week.

Novell bids to regain momentum

By Elisabeth Horwitt

Just how late in the game is it for Novell, Inc.?

Customers and analysts are wondering if Chief Executive Officer and Chairman Robert Frankenberg can provide the strategy and the products to convince key corporate customers that Novell, rather than Microsoft Corp., is the best horse to ride into their client/server future.

Novell watchers so far seem to agree on two things: Frankenberg is up against some serious challenges, and he is the right man to take them on.

Novell's history has in many ways been the classic business blunder. Founder Raymond Noorda turned a tiny, insignificant player into the leading network operating system company. But then he took about three years longer than was advisable to step down.

In the process, analysts said, the founder made some ill-advised decisions that spread Novell's resources in too many directions and caused it to lose focus and miss some key dead-

Novell, *page 16*

Novell is considering whether to port NetWare Directory Services to other platforms including other vendors' Unix systems and NT.

Users await database price relief

By Kim S. Nash
and Thomas Hoffman

Database users are smelling bargains as competitive pressures force Oracle Corp., Sybase, Inc. and others to wheel and deal for new business.

Deep discounting announced by Microsoft Corp. — and more recently, Computer Associates International, Inc. — is likely to compel market leaders Oracle and Sybase to respond in kind, according to 10 users and analysts interviewed.

"It's getting stickier by the day for these guys to maintain the premium pricing they're used to," said Cory Isaacson, president of CompuFlex International, Inc., a third-party applications firm in Woodland Hills, Calif.

One sign that database heavyweights are bending to price pres-

Price relief, *page 127*

One-upmanship

As bargains begin to appear, would-be database customers would be wise to shop around before committing to one vendor

DATABASE	TYPICAL PRICE PER USER
CA Openingres Success Pack*	$200
IBM DB2 2	$425
Informix OnLine	$200 to $1,200
Microsoft SQL Server	As low as $150
Oracle 7	$300 to $1,200
Sybase System 10	Not offered

*Includes development tools as well as database

Sources: Industry analysts, database firms

Client/Server ROUNDTABLE

FIRING: You'll have to do it.

HIRING: Talent ain't cheap.

GAMBLING: You'll roll dice on unknown vendors.

Four IS execs speak out.
See In Depth, page 91

HP learned lessons well

By Jean S. Bozman
PALO ALTO, CALIF.

Hewlett-Packard Co. is sailing on calm seas these days, its profits surging while competitors IBM and Digital Equipment Corp. struggle to right their corporate ships following recent reorganizations.

As users prepare to attend Interex, the HP user conference in Denver this week, many customers said the company has learned how to pamper its installed base.

With products targeted at the hot markets of PCs, desktop printers and enterprise servers, HP saw profits grow to $347 million in its third quarter, which ended July 31. Its revenue has more than doubled since 1988,

CEO Lewis Platt: *Running as a collection of small companies is critical for HP*

and some of its businesses are growing at rates of 50% or more (see story page 28).

But the $20 billion diversified electronics firm has an institutional memory like an elephant: Its top executives are ever mindful of its crises in the mid-1980s and early 1990s. They plan to head off similar trouble by spotting it early.

"I think there's a sort of healthy paranoia that runs around inside of HP," said Lewis Platt, who replaced John Young as chief ex-

Hewlett-Packard, *page 28*

Newspaper

We offer MPP. SMP. And a 10-year track record.

Maybe that's why 220 of the world's top companies are already working with us.

We didn't just announce decision support. We invented it.

Our clients include the three biggest retailers in the U.S. Six of the top eight banks. Six leading regional phone companies.

Altogether, we provide over 80% of the world's commercial parallel processing.

We're the one company with the technology, experience and service support to help you turn summary transactional data into detailed information.

In any form. Any quantity. And from any number of locations.

Information which can be used by your executives, marketing, product development, distribution and salespeople. To cut product development time. Reduce markdowns, overstocks and understocks. And become super-responsive to customers.

MPP. SMP. And a 10-year track record.

Lately, other manufacturers have announced their own decision support strategies.

But of all the information companies out there, we're the ones who offer both massively parallel processing and symmetric multiprocessing.

Not some day. Today.

And all our systems are totally open and completely scalable. Based on industry-standard Intel® microprocessors.

So you can get into decision support at any level. And grow as your needs grow. Without having to change architectures.

Choice of database solutions.

To help you get the most out of decision support, our systems run your choice of industry-leading parallel databases. From Oracle,® Sybase,® and Informix.®

As well as our own Teradata® database. With over 13 years of design, development and field experience behind it.

Get IT. Move IT. Use IT.™

No other company can help you with a total decision support solution like we can.

We can help you Get data from legacy databases, point-of-sale, PC LANs, you name it.

Move it. By LAN, WAN, fiber optics, satellite. To where it can be warehoused, crunched and cross-referenced with other data.

Then help you Use its insights. Moving detailed information back to the people who need it.

Find out more about decision support and parallel processing from the company with the world's largest installed base. And more than 400 successful applications already in place.

Call 1 800 421-7942. We'll tell you more.

Teradata is a trademark of AT&T Global Information Solutions. All other products are trademarks or registered trademarks of their respective companies. ©1994 AT&T Global Information Solutions

GET move USE IT.

Now that NCR and AT&T are one, computing and communications have come together to help you get, move, and use information.

AT&T
Global Information Solutions

Interested in decision support? Here's your choice:

The company that pioneered it.

Or somebody that's still learning about it themselves.

A PUBLICATION OF IDG

What's Inside

September 19, 1994

See Page 97

NEWS

■ **Microsoft** promotes the networking capabilities of NT. *Page 2*

■ IBM will ship its long-awaited **PowerPC-based** desktop systems on a limited basis, giving its often-delayed version of OS/2 for those systems time to catch up. *Page 4*

■ Lotus announces a cheaper, lower-function version of Notes, upsetting part of its installed base. *Page 2*

■ October will see IBM trying to revive its server business and announcing new notebooks and a new desktop strategy. *Page 6*

■ MCI introduces a Windows software product bundled with a **multimedia**, public network service. *Page 8*

■ Software 2000 readies object-oriented applications supporting client/server installations with IBM's **AS/400**. *Page 10*

■ At **Networld/Interop '94**, Cisco targets the remote-access market with 15 new products and an umbrella strategy. *Page 12*

■ Microsoft reveals the structure of its **Systems Management Server**, previously known as Hermes. *Page 14*

■ Multitasking **digital signal processors** could give users new, easier ways to add features to their systems. *Page 20*

COMPUTER INDUSTRY

■ **Cray Research** temporarily suspends most of its manufacturing while it retools to reduce turnaround times on systems. *Page 32*

DESKTOP COMPUTING

■ **D&B Software** plans to unbundle SmartStream desktop functions. *Page 43*

WORKGROUP COMPUTING

■ Sun's **Wabi** Windows-on-Unix application interface is being revised for the second time. *Page 49*

ENTERPRISE NETWORKING

■ First Virtual rolls out products to push **multimedia** to the desktop via low-cost ATM. *Page 61*

LARGE SYSTEMS

■ SAS rounds out data access options. *Page 69*

APPLICATION DEVELOPMENT

■ Sybase wipes out its old-fashioned, one-size-fits-all support program. *Page 79*

IN DEPTH

■ Four CIOs recall the trials and tribulations of developing and managing **client/server** applications. The big issues: database performance, retraining mainframe staffers, firing those who don't make the cut and convincing management it's safe to bet the company on a tiny software vendor. *Page 91*

CAREERS

■ It's time to get acquainted with **wireless LANs**.. Fifty-seven percent of the companies surveyed plan to implement the technology eventually. *Page 99*

MARKETPLACE

■ **Network outsourcing** can work, but don't expect a perfect match at first. It takes time to find a vendor you can live with. *Page 110*

COMMENTARY

■ **Charles Babcock** views Digital's Alpha chips as technology leaders that have to overcome Digital's business difficulties. *Page 6*

■ **Paul Gillin** says the *Computerworld Premier 100* listing shows that business is going back to simpler values: Deliver quality at a fair price, and do more while spending less. *Page 36*

■ **Gary Law** says the seeming disarray in the network industry is actually a logical reaction to changes in users' needs. *Page 37*

The CW Premier 100

Computerworld's annual review of the U.S. leaders effectively using information technology is presented this week in a special publication mailed with the weekly *Computerworld* issue. To obtain additional copies of the *Premier 100* issue, call (800) 343-6474 and ask for the back issues department.

Calendar ..... *Page 88*

Company index ..... *Page 123*

Editorial/Letters to the editor ..... *Page 36*

Sept. 16 Stock Ticker ..... *Page 125*

How to contact Computerworld ... *Page 128*

Executive Briefing

Novell Chairman and CEO Robert Frankenberg has impressed customers and analysts alike by providing Novell with its first coherent product strategy in years, demonstrating a readiness to trim the organizational and product deadwood and avowing that Novell will stick to its NetWare knitting and not fritter away resources battling Microsoft in the desktop arena. *Cover 1*

U.S. Senate passage of interstate banking legislation could impact the IS operations and activities of regional and superregional banks by accelerating data center consolidations and cross-geographical standardization of branch applications. *Cover 1*

Hewlett-Packard sales are surging, even as computer competitors IBM and Digital work through recent reorganizations. Users and analysts say HP has been willing to learn from its mistakes to become more responsive to user requirements and cater to its installed user base to keep them on-line. *Cover 1*

Given the Internet's lack of security, intellectual property protection and ease of use, using the so-called information superhighway still presents daunting hurdles for many business users. *Page 24*

Investing $20 million, Boeing Commercial Airline Group, the world's biggest maker of commercial jetliners, will replace its homegrown legacy manufacturing system with a set of distributed, client/server packages from Baan USA. *Page 79*

Mere fad or truly fantastic? *Computerworld* readers review the latest objects of our information systems affections and share their views on which trends, products and technologies deserve to be tossed into the dustbin of history. *Page 83*

Users are getting more power on their servers as vendors push performance envelopes with multiprocessor Pentium PC architectures. But the question is, are customers willing to run the enterprise on such systems? *Page 49*

Microsoft seems to be thinking "enterprise" these days. It is preparing a bunch of server-based products in preparation for a showdown with Unix. *Page 1*. Meanwhile, Microsoft is touting the networking capabilities of NT and promoting the Systems Management Server product, formerly Hermes. *Pages 2 and 14*. On the service front, Microsoft is targeting large developer and corporate customers with changes in its support programs. *Pages 2 and 44*.

The 5th Wave *by* Rich Tennant

NT interoperability scores big at Interop

By Suruchi Mohan
ATLANTA

Microsoft Corp.'s Windows NT 3.5 may have established itself as a serious competitor to rival network operating systems at the Networld/Interop '94 conference here last week.

Skeptical users who came to the show expecting more marketing hype from Microsoft were pleasantly surprised when the company demonstrated the networking capabilities of Windows NT 3.5, codenamed Daytona, instead of presenting merely another slide show.

"The live presentation was unbelievable," said Doug Pruss, principal at CDS Tech Knowledge Ease, a business and technical training and development company in Atlanta. He said he was "very impressed that so many different servers and clients were accessible in real-time format. I saw 3.1 of NT in beta; [these] concepts were talked about."

Microsoft certainly touts this interoperability as one of its biggest strengths. Windows NT clients can access any of a host of servers, most notably Novell, Inc.'s NetWare, Unix, Banyan Systems, Inc.'s Vines and Digital Equipment Corp.'s Pathworks.

Indeed, Microsoft is aiming Daytona at large NetWare 3.x installations that are hesitant to make the migration to NetWare 4.x but want to add advanced networking features incrementally, said Dwayne Walker, general manager of solution sales and marketing.

Walker said the goal is not to replace NetWare 3.x with NT, but rather provide NT as an adjunct to NetWare 3.x installations. He said Daytona offers several advantages that NetWare 4.1 lacks. These include better remote connections via Microsoft's Remote Access Server (RAS), which is free with Daytona. And Daytona provides the most important advantage users get by migrating to NetWare Directory Services (NDS): the ability to have a single log-on and administration across multiple servers, Walker claimed.

Novell Chairman and Chief Executive Officer Bob Frankenberg disagreed. Daytona's Domain Directory lacks key NDS features, such as directory synchronization across domains and performance tuning, he said.

Heads turn

"We came here assuming we would go Novell but after the show are [now] extremely interested in NT," said David Kimble, a managing director at TEI Technology Enterprises, inc., a management consulting firm in Cleveland.

"Initially, we blew off NT," said Walter Kuleck, a managing director at TEI. "We went from [NetWare] 3.11 to 4.01 and back to 3.12," he added. "Microsoft is offering a modular change in their software instead of [an] architectural [change] like Novell."

But NetWare users are not the only targets. In its attempt to be everything to everybody and to play up its theme of interconnectivity, Microsoft is providing native support for 32-bit TCP/IP, 32-bit IPX/SPX, Apple Computer, Inc.'s AppleTalk and, of course, its own NetBEUI.

Although users are not sure what to expect from 32-bit TCP/IP or Dynamic Host Control Protocol, which automatically configures the Internet Protocol host, they said they are happy about native TCP/IP support.

"A strong selling feature [of NT] is support of TCP/IP," said David Thompson, manager of operations at the Ministry of Environment in Victoria, British Columbia. He said he wants to consolidate his three protocols to one — TCP/IP.

Also, AppleTalk support in NT could make his life easier than Macintosh support on NetWare, which comes as a NetWare Loadable Module and needs additional support and administration, Thompson said.

Additionally, as part of Daytona, Microsoft is offering its RAS, which supports remote connections over a variety of dial-up protocols, including Basic Rate interface Integrated Services Digital Network (ISDN) (128K bit/sec.). This is of extreme importance to companies trying to transfer large files to distant locations. Novell claims to be adding ISDN and other services to its NetWare Connect product next year (see story page 4).

David Meunier, president of Cascade Computer Technologies, a health care consultancy in Tacoma, Wash., said NT's ability to handle large files and send them over large areas will be a major factor when he selects an operating system for the hospitals his company serves.

Trust is lacking

But despite the optimism, users are still wary from past experiences with Microsoft's strategy. "They've been promising Chicago for 1½ years now," said Shankar Lakshman, a software development engineer at Wandel & Goltermann, an electronic measurement technology company in Research Triangle Park, N.C.

Although Ty Carlson, program manager for Windows NT at Microsoft, said the product has been released to manufacturers, he would not give the shipping date except to say it would be announced at Windows World in Dallas this week.

Also, pricing was not announced at Networld/Interop '94 and is expected at Windows World. For some users, pricing could be the deciding factor.

For Dan Cox, systems engineer at Rockwell International Corp. at the Kennedy Space Center in Florida, it is. "If 32-bit [architecture] makes my network faster, it helps. The question is, 'How much will it cost?' "

Senior editor Elisabeth Horwitt contributed to this article.

Lion's share

Which of the following are you more likely to make the basis of your client/server strategy?

BASE: 209 NOVELL USERS

Source: Computerworld Database Division, Framingham, Mass.

Notes Express elicits mixed reviews

By Lynda Radosevich

■ Reversing its previous public declarations, Lotus Development Corp. last week announced a cheaper, lower function version of its groupware software, named Notes Express. In the process, Lotus drew an angry response from at least part of its installed base.

As announced at Networld/Interop '94 in Atlanta last week, Notes Express is a subset of Notes that includes Notes electronic mail, group discussion databases, news feed, reference information databases and shared phone books. It costs $99, but most LAN E-mail users can purchase it for $60 per user through an incentive program. Full Notes is listed at $495 and costs roughly $330 per user with bulk discounts.

What is missing is the Notes application development capabilities. Also, Notes Express is limited to running the applications provided. In short, it is not a runtime version that Notes sites can distribute to users to access customized applications.

The announcement drew critical response from at least two sectors of the Lotus customer base. Reaction broke down as follows:

- Classic user angst from CC:Mail users who worried that their needs will be deprioritized as Lotus pushes Notes and Notes Express as its strategic high-end and low-priced messaging and groupware product line, respectively.
- Anger from some Notes users because Notes Express is not a runtime version.
- Enthusiasm from other Notes sites already committed to wide-scale deployment and from companies that want to experiment with the groupware platform at a lower cost

Gulf Canada Resources Ltd., an oil exploration and production company in Calgary, Alberta, has 1,200 CC:Mail users and 100 Notes users. The frustration expressed by Bob Stratton, technical adviser at Gulf, summarized the response of several Lotus customers contacted last week.

"Personally, I can't think of a more useless waste of time. I was looking for a runtime version at a much lower price that would run everything we developed in Notes but would not give end users the Notes development capabilities," he said.

On the E-mail front, Stratton said if Lotus did not clarify its Notes vs. CC:Mail message and deliver on CC:Mail updates, he would move to Microsoft Corp.'s Mail.

Lotus officials said the company would not ignore its CC:Mail base, which at 5 million is more than five times the Notes installed base. Notes Express is simply an early edition of one of the CC:Mail/Notes integration products promised last September, they said.

Those products include the Lotus Communications Server (LCS), which is meant to help integrate the very different Notes and CC:Mail back ends. Also, Client/Server CC:Mail was to be the new E-mail client that worked with LCS. Together, the products were designed to give CC:Mail users a strategic upgrade path to client/server messaging based on Notes.

Although Notes Express uses the Notes E-mail interface now, both Notes and Notes Express E-mail will be updated in the LCS time frame to look like CC:Mail. So if CC:Mail users begin switching to Notes with the help of LCS, at least they will not have to retrain users on how to use the E-mail part of Notes, Lotus said.

Sound confusing? It is, CC:Mail users said, and that is part of the concern. Spurring their worries was admission from Lotus that the LCS is still a year from delivery.

Among the enthusiastic users were sites that had halted plans for big Notes rollouts because of high software costs

Notes Express "will speed up [a sizable rollout], take a bite out of the financial costs and give us the ability to upgrade incrementally," said Gary Lasko, director of information technology at insurance broker Sedgwick, Inc.'s North American operations in Memphis.

groupware

Taking full advantage

Third-party developers can access the program via the Notes API. That will let them write applications with Visual Basic and other tools that use the Notes object stores. Also, Notes Express includes the ability to "switch on" full Notes capabilities for an extra $250. Users first must upgrade the Notes Express server to Notes 3.2.

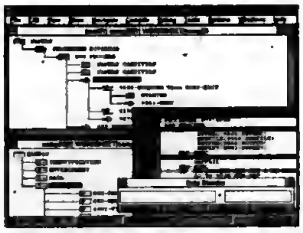
It's simple to get a self-running demo and a free copy of The Secret Of COBOL Maintenance. Just call 1-800-434-REAL.

Compared to the competition, CA-Realia II Workbench is twice the product at half the price.

$2,500
For A Limited Time.

	CA-Realia II Workbench	Competitive Product
Fully integrated, intuitive programmer's workbench	✓	
Debug both PC and mainframe-based programs	✓	
Fast compiles and efficient execution	✓	
Complete single-vendor solution	✓	
Supports Windows and OS/2	✓	
Foundation for GUI Client/Server COBOL development with open DBMS access	✓	

The competition simply can't compete with CA-Realia II Workbench.



The point-and-click debugger simplifies testing.

"It's easy to use. And that makes me and my staff a lot more productive."

FAME Awards

Awarded the Federal Applications Medal of Excellence.

- GUI Editor
- GUI Interactive Debugger*
- GUI Program Analyzer
- CICS Emulator Included
- Version Control Included
- Fastest PC COBOL Compiler*

Avoid That Empty Feeling. Get The One COBOL Solution That's Fully Loaded.

Compared to CA-Realia® II Workbench, other COBOL development solutions come up empty – unable to compete with the most comprehensive client/server tool in the industry.

One that provides an unsurpassed list of benefits and features which include: the world's fastest PC COBOL compiler, a GUI editor and an interactive GUI debugger for code executing on a PC or mainframe, and integrated lifecycle management. Plus a COBOL-intelligent program analyzer that's the smartest thing you've ever seen.

What's more, CA-Realia II Workbench includes a complete mainframe CICS emulator for no extra charge. And, all the features of the workbench apply to CICS programs as well as batch.

So whether you're in a Windows or OS/2 environment, CA-Realia II Workbench provides complete integration with your host-based systems. Which means unlike some other COBOL solutions, your programming choices are never limited.

For A Self-Running Demo And A Free Copy Of The Secret Of COBOL Maintenance, Call 1-800-434-REAL, Dept. 26102.

You'll see when it comes to COBOL client/server development solutions, only one has been fully developed: CA-Realia II Workbench.

COMPUTER ASSOCIATES
Software superior by design.

CA-Realia® II Workbench
The Complete Client/Server COBOL Solution

© Computer Associates International, Inc. Islandia, NY 11788-7000. U.S. dollars. Offer good in U.S. and Canada only. All product names referenced herein are trademarks of their respective companies. Awarded by *Government Computer News*, March 23, 1994. *Source: *Computerworld* Buyer's Scorecard, March 25, 1991.

Divided camps move closer to agreement

IBM PowerPCs to become available next month

By Ed Scannell and Michael Fitzgerald

After months of fence-sitting, IBM will finally announce availability of its PowerPC-based systems next month — but only on a special-bid basis, sources close to the company said.

"We're taking a phased roll-out approach to our introduction of PowerPC-based PCs," a spokesman said.

On Oct. 17, IBM will ship three products: the IBM PC PowerSeries 440, a PowerPC 601-based desktop; the PowerSeries 640, a 603-based desktop; and the ThinkPad PowerSeries 850, a 603-based notebook, sources said. General availability is targeted for late March or early April, the sources said, but IBM would confirm only a target of sometime in the first half.

IBM said this will buy more time for IBM's Personal Software Products group and other vendors to develop software. OS/2 for PowerPC, delayed twice, is not expected to be available until mid-June 1995. In the meantime, IBM will offer its AIX operating system along with a version of Microsoft Corp.'s Windows NT.

IBM confirmed it has already shipped "several hundred" PowerPCs on this special-bid basis, mostly to universities, developers and large corporate users.

Some users, however, said they were somewhat disappointed by the special-bid decision given that the price/performance of the machines cannot be specifically compared to Intel Corp.-based systems.

Uneasy feelings

Also, the lack of fully exploitive applications, or knowledge of how well existing software will run under OS/2 for PowerPC, has made users hesitant to commit to the upcoming systems.

Jonathan Handler, a senior consultant at the Blue Cross/Blue Shield Association in Chicago, said, "The association is not making any buying decisions about PowerPC. We need an operating system and applications for it." He added that he was encouraged to hear that many OS/2 independent software vendors intend to port their applications to PowerPC.

Senior editor Ellis Booker contributed to this story.

Apple works toward adoption of Prep standard

By Mark Halper

Apple Computer, Inc. confirmed last week that it continues to work toward bringing its Power Macintosh in line with the PowerPC Reference Platform (Prep) pushed by IBM and Motorola, Inc.

However, the Prep standard that IBM is following is so incongruent with Apple's operating system that "it would take about two years for us to port the Mac [operating system] to the current spec," said Don Strickland, Apple's vice president of licensing.

Apple already plans to adapt one Prep standard element by replacing its NuBus system bus with the Peripheral Component Interconnect bus. Strickland said the company is considering other hardware changes and hopes Prep "will evolve to have more features friendly with the Macintosh."

The IBM and Apple approaches differ on a number of fronts, ranging from the way printers and keyboards are connected to the ability to build IBM machines from off-the-shelf application-specific integrated circuits (ASIC) while Apple requires custom ASICs.

Strickland also said last week that Apple plans to license its operating system to computer vendors that are strong in markets where Apple does not have a significant presence. Those will include foreign countries and could also include niche markets in the U.S., he said.

Apple hopes that licensing will increase unit sales of Macintosh-compatible machines by 25% to 30% a year over the next two to three years, he said.

Novell hits back at NT 3.5 with additional features

By Elisabeth Horwitt

ATLANTA

Novell, Inc. is preparing to strike back next year against Microsoft Corp.'s networking push with Daytona (Windows NT 3.5). But first, it must correct some shortcomings.

During the fallow period in which former Chairman Raymond Noorda was preparing to step down, a virtually leaderless Novell slipped in several key connectivity areas where it once led its network operating system rivals, according to Rick Villars, an analyst at International Data Corp. in Framingham, Mass.

It is particularly weak in providing TCP/IP connectivity to Unix servers and Internet services, Villars said. For instance, where Daytona offers full TCP/IP support, Novell has "cobbled together support" of TCP/IP, according to Joe Schwartz, a consulting engineer at Bankers Trust in New York.

A Novell spokesman said the company will provide Dynamic Host Configuration Protocol — already in Daytona — on its LAN Workgroup TCP/IP server next year. Novell will also support Mosaic, World-Wide Web and full TCP/IP access on its upcoming Advanced Client, due next year.

Novell also needs to catch up in the remote connectivity arena. Microsoft's Remote Access Server, which will come bundled on Daytona, connects laptops to both NT servers and, through them, to NetWare servers via Point-to-Point Protocol, Integrated Services Digital Network (ISDN) and Serial Line Interface Protocol, a Microsoft spokesman said.

Novell said it will provide its NetWare Connect remote server with the missing ISDN support in its next release, due out in the first half of 1995.

On the way

Beyond that, Novell has the following in the works:

- **Mobile IPX**, which will support IPX-based access across wireless connections including cellular, data radio and infrared. A future technology will maintain the connection during signal fade-outs that occur in tunnels.
- **Mobile Client**, which will support file replication and synchronization so that a laptop user can plug into the LAN, access information, unplug, work on it, plug in again and have the new information automatically update the original file on server.
- **Mobile messaging**, which will facilitate message exchange for mobile users.

Oracle challenges Lotus

Oracle Documents seeks to rival Notes' features

By Kim S. Nash

■ Oracle Corp. plans to make good next week on vows to go after Lotus Development Corp.'s Notes with a groupware product of its own. The new offering — called Oracle Documents — adds improved text retrieval and other features to Oracle's existing office automation product, sources close to the company said.

Oracle officials declined to comment on Documents' technical specifics but confirmed it will be unveiled at next week's conference of the International Oracle Users Group in San Francisco. Shipping is expected by the end of the year.

Early glimpses of the groupware contender impressed users, who said it could hijack a portion of Notes installed base.

While Notes mainly caters to small groups of workers on a LAN, Documents "is a true enterprise product, built that way from the start," said Bruce Selvog, a systems programmer in charge of the Tennessee Valley Authority's 12,000-user office automation/electronic-mail system.

Targeting Notes users

Based on the Oracle Office 2.0 E-mail and scheduling product, Documents would appeal to Notes users hemmed in by Notes' inability to support corporate applications running on wide-area networks, according to a database analyst at a large pharmaceutical firm.

"Oracle could capitalize on that need," said the user, who asked to remain anonymous. "If [Documents] can interface with Notes, all the better."

One shortcoming of Office 2.0, however, is the product's lack of support for two major E-mail protocols: Vendor-Independent Messaging and Messaging Application Programming Interface [CW, Feb. 28]. It is unclear whether Documents will work with either protocol.

Important features

According to users, key features of Documents include the following:

- Support for SQL commands to get at corporate data. As a flat-file database, Notes handles only text and cannot understand SQL commands.
- Multimedia support via an interface between it and Media Server, a version of the Oracle 7 database designed to manage full-motion video and CD-quality sound.
- Native support for the X.400 E-mail standard instead of handling X.400 protocols through an interim gateway.

Oracle is also expected to tie its recently announced Oracle in Motion wireless database access product set to Documents.

Different strategies

Oracle is also expected to tie its recently announced Oracle in Motion wireless database access product set to Documents. Lotus, meanwhile, recently shelved a similar effort to let users tie radio and cellular devices to Notes [CW, Sept. 12].

"Disconnected clients like that would save us a bundle in telecommunications costs, with so many of our people on the road," Selvog said. The federal agency reaches across seven Southern and Midwestern states, he noted.

Pricing was not available, but Documents' precursor, Oracle Office 2.0, costs $150 per user, plus the cost of the underlying Oracle 7 database.

AT LAST. ALL THE POWER OF ORACLE7 IN A VERSION ANYONE CAN HANDLE.

ORACLE7 WORKGROUP SERVER™: REALLY, REALLY SIMPLE YET VERY, VERY POWERFUL.

Oracle7 Workgroup Server replaces SQL database complexity with point and click simplicity. Pretuned and preconfigured for results right out of the box, Oracle7 Workgroup Server™ is the ideal database for workgroups from two to twenty-five. Best of all, it's 100% compatible with all leading Windows® applications and tools. Add a powerful array of graphical administration tools plus Oracle7's blistering speed and infinite scalability (PC MAG. Editors' Choice), and you have an affordable, simple yet powerful server the competition may promise, but can't deliver. Prices start at $995 (2-user version). For a free informational video call **1-800-633-1071 ext 8140.**

Friendly graphics indicate systems status.

Simple checkboxes & pick lists make administration easy.

ORACLE

©1994 Oracle Corp.

Alpha may not win, but it's the best

Digital's recent unveiling of a 1-billion-instructions-per-second chip offers clear testimony to the excellence of its engineering vs. its disarray as a business.

Much of the blame for this dichotomy can be laid at the feet of former President Ken Olsen, whose engineering prejudices kept business managers at The Mill one step removed from power. Olsen, however, has been gone for two years, and all Digital has done in the meantime is create doubts about its determination to get itself out of a string of losing quarters. If Digital's engineering culture is to survive, it needs Alpha to succeed. And for Alpha to succeed, Digital needs a no-nonsense display of good business judgment.

If it were purely a technical matter, Alpha would stand tall. Its superior design was evident Sept. 7 when Digital announced it is producing the second generation AXP 21164 chip, with a 300-MHz clock speed and a 1.2-billion-instructions-per-second capability. These attributes are a stunning distance ahead of Pentium, PowerPC and SPARC, and they spring from relatively standard 0.5-micron circuits. It is within Digital's power to plunge to 0.3 micron circuits and gain more speed.

Digital needs a no-nonsense display of good business judgment. If it were purely a technical matter, Alpha would stand tall.

Charles Babcock

The features I like about Alpha include the following:

- **Operating system independence:** Alpha was designed to be operating system-neutral. Its Privileged Architecture Library (PALcode) contains optimized subroutines for basic operating system functions such as context switching, memory management and interrupts. These exist in a software layer independent of both the operating system and hardware. The PALcode is loaded into system memory from a flash programmable read-only memory (PROM), and adding PALcode for another operating system to the PROM is not a big deal compared with converting the whole operating system. Alpha ships with the capability of running OpenVMS, OSF/1 and Microsoft's Windows NT.
- **Multiple instruction launch:** The 21164 issues four instructions per clock cycle, thanks to its superscalar design. Intel's Pentium, another superscalar chip, issues roughly two instructions per cycle. Alpha gains a 6-to-1 advantage in floating-point execution over Pentium and 3-to-1 over the PowerPC.
- **64-bit:** Alpha is a true 64-bit architecture, unlike Hewlett-Packard's 64-bit implementation that mimics 64-bit by doubling up clock cycles in a 32-bit design. Alpha implements 1T byte of physical address space. Meanwhile, 32-bit systems support 4G bytes.
- **Parallel processing:** Alpha is a chip that lends itself to running in parallel processor configurations due to the broad bandwidth of its internal communication pathways. Many RISC chips will not lend themselves to top parallel performance beyond four processors.
- **Partitioned register file:** Integer registers and floating-point registers are frequently combined into one register file on a chip. Both operations are performed out of the file, requiring multiple reads and writes. Alpha separates the two registers and puts them on opposite sides of the chip, close to their adder and multiplier circuits. Alpha compilers are written to honor this more complicated approach.

There are many other features on the Alpha chip that represent an escape from known bottlenecks. Alpha's architects sought to break with the constraints of existing RISC designs and Digital's VAX processors to come up with a truly modern computer.

Despite its many strengths, Alpha may be a case of superior technology that does not win out. It is carrying the millstone of Digital's business problems as it tries to win new adherents. But win, lose or draw, the principles around which Alpha was built will continue to influence computer design for years to come.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

PC server market

IBM server moves could trigger PC comeback

By Jaikumar Vijayan and Michael Fitzgerald

At Networks Expo in Dallas today, IBM is expected to demonstrate a dedicated high-bandwidth add-in card said to turn PC servers into mini mainframes. Its launch kicks off what could be the first day of the rest of the floundering behemoth's life in the PC market.

The card, slated for delivery on Oct. 24, will enable IBM to provide a breakthrough in bandwidth and throughput for the PC server market, claimed Michael Coleman, general manager of IBM's Server business.

The breakthrough should let IBM outstrip rivals such as Compaq Computer Corp. and Hewlett-Packard Co. in the PC server business, and it may signal that IBM is no longer constraining the IBM PC Co. from doing battle with IBM's larger systems divisions.

Also, the new 60/90-MHz, Intel Corp. Pentium-based servers, part of a long-overdue announcement, will feature support for Peripheral Component Interconnect (PCI), enhanced versions of IBM's NetFinity network management software and a mainframe-like intelligent subsystem that will support special dedicated processors such as the communications add-in card. The base price is expected to be in the $12,000 range, according to sources close to IBM.

Fall into products

The servers will cap IBM's fall announcements in the PC market. Other introductions will include the following:

- Aptiva, the PS/1 replacement, due Sept. 26.
- High-end ThinkPad notebooks (see story page 7) and a strategy to unify the PS/2 and ValuePoint lines into a single brand called the IBM PC Desktop series, due Oct. 17. IBM will also announce limited availability of its PowerPC systems (see story page 4).
- The new PC servers, which will be followed by other application servers early next year, due Oct. 24.
- 60/90-MHz and 66/100-MHz Pentium-based two- and four-way multiprocessor application servers, which will be upgradable to the PowerPC through a motherboard/daughtercard implementation, due later in the fourth quarter.

IBM declined to comment on unannounced products.

For many users, the products follow too many disappointments to rekindle any sparks of interest in IBM.

"IBM's emotional loyalty has evaporated here," said an information systems executive at a large corporate user site who requested anonymity.

Analysts say they expect the products to slow but not halt IBM's PC market share erosion in the short term. However, they say that over time, if it effectively executes a fundamental reorganization centered around consolidating the PC Co. in Raleigh, N.C., the company will be in position to bounce back and perhaps even reclaim its No. 1 market position [CW, Aug. 1].

Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass., said an effective server strategy was a must for IBM's recovery.

Worldwide PC server shipments

Compaq	152,267	301,750
Apple	165,267	291,278
IBM	176,286	261,521
Dell	75,125	90,135
Hewlett-Packard	28,298	38,562

Source: Dataquest, Inc., San Jose, Calif.

"IBM is losing share in the client business because of the gap in its server business," he said. For example, Compaq has used its superior servers to get a foothold in corporate accounts and then has successfully gotten users to buy Compaq on the client side as well.

Tom Kucharvy, president of Summit Strategies, Inc. in Boston, added that focusing on a dedicated server strategy in the high-end uniprocessor server market would give IBM a unique approach from which to rebuild share.

IBM will also beef up its NetFinity server management software with support for Windows and Novell, Inc. NetWare servers, according to Coleman.

Long way to go

IBM's fall announcements will mark its first big push into Pentium, and the behemoth has a long way to go to catch up to its competitors. Dataquest, Inc. reports that IBM sold 8,400 Pentiums in the U.S. in the second quarter this year. By contrast, Compaq sold 32,500, Gateway 2000, Inc. sold 57,000, Dell Computer Corp. 38,000 and Packard Bell Electronics, Inc. 38,000 units.

An issue of time

"How come it took them so long to come out with these features?" asked Ken Sacca, a LAN administrator at law firm Fish & Richardson in Boston.

Sacca has already switched allegiance from IBM to Compaq, which has been beating IBM to the server technology punch.

Analysts said the upcoming ThinkPads would extend IBM's technical leadership in the notebook market. Meanwhile, the impact of the desktop brand unification strategy will take time to develop.

The Desktop Series 400 and 700, which top out with a 66/100-MHz Pentium system, will require a multiquarter transition, particularly in moving customers from the PS/2 to the Select-A-Bus architecture in the ValuePoint, sources said. Select-A-Bus gives users the choice of Micro Channel Architecture, PCI, Extended Industry Standard Architecture and AT-bus peripherals.

Senior editor Ed Scannell contributed to this article.

Vendors are offering more powerful servers, but will users swallow the cost? See page 49.

New-wave notebooks boast 'desktop envy'

By Michael Fitzgerald

■ The desktop will come to the notebook market this fall in the form of Pentium chips, true-color screens and industrial-strength, integrated multimedia functionality.

This means notebooks with features typically found in desktop systems, such as high-resolution screens and integrated CD-ROM disk drives — but at a premium. Prices on these high-end notebooks approach $8,000.

The changeover started last week with announcements from NEC Technologies, Inc. and Panasonic Personal Computer Co. and will accelerate Oct. 17 when market leaders IBM PC Co. and Toshiba America Information Systems, Inc. unveil notebooks, according to sources close to the companies.

IBM will announce a 7.2-pound, 33/100-MHz DX4-based ThinkPad with an integrated 5¼-in. CD-ROM, built-in infrared communications, a built-in speakerphone/answering machine and a new "black matrix" display that supports 64,000 colors and reduces glare, according to sources close to IBM.

NEC Technologies' Versa M series *will feature 24-bit true-color screens, though battery life will fade to 50 minutes*

Toshiba, meanwhile, will counter with the T4900, the first Pentium notebook based on the 50/75-MHz chip that Intel Corp. will announce the same day, sources said. Besides Pentium, the redesign will include the AccuPoint integrated pointing device and a 10.4-in., active-matrix color screen, the sources said.

IBM and Toshiba refused to comment.

'Desktop envy'

"It's desktop envy," said Andrew M. Seybold, editor in chief of the Brookdale, Calif., newsletter "Outlook on Mobile Computing." He said the bulk of the market wants full-featured notebooks that weigh less than the 6 to 7 pounds typical of today's models. Vendors tend to chase after the "desktop replacement" market with the idea that users want a portable computer that effectively lets them carry a desktop-class system into the field.

Still, the idea of features such as an integrated CD-ROM drive appeals to some users.

"We see [multimedia notebooks] as a competitive advantage," said Victoria Obenshain, vice president of marketing services at Lutheran Brotherhood Insurance in Minneapolis. She said video and audio pulled off a CD-ROM were differentiators for the company's sales force.

Similarly, John Johnson, a senior programmer at DynCorp. in Reston, Va., said his firm wanted integrated CD-ROM drives and higher-resolution screens to free up hard disk space and provide better viewing.

Exemplifying the trend were two recent announcements:

▶ NEC announced the first notebooks with 24-bit true-color screens, or 800- by 600-pixel resolution. The 25/75-MHz DX4- and 33/100-MHz DX4-based Versa M TFT True Color models are priced from $5,399 to $6,159. The high-end version starts at $5,899.

▶ Panasonic announced the V41, which incorporates a 5¼-in. CD-ROM drive, 16-bit stereo sound and a 10.4-in. screen for both passive- and active-matrix color models. It costs $4,299 to $7,799.

When the lights go out
IAM opens its eyes...
reducing night processing by 50 to 80%

NEW FEATURE:
ESDS support now available
with IAM Version 6.2

Convert your ESDS files to IAM and...
• Save 30 to 50% on DASD space
• 30 to 50% Elapsed time savings
• 30 to 60% savings in EXCP's

Call for a FREE
No Obligation 90 Day Trial

DATA PROCESSING

Available for All MVS
Operating Systems

CORPORATE HEADQUARTERS

EUROPEAN
OFFICES

News Shorts

CIOs moving and shaking

Last week was busy for at least two information systems groups. James L. Halsey was named senior vice president and chief information officer at **Warner Bros, Inc.** in Burbank, Calif., effective Nov. 1. At **Avon Products, Inc.**, Spencer McIlmurray replaces Raymond Perry as top IS executive at the New York-based cosmetics firm. Meanwhile, a presentation at the **Society for Information Management's** conference this week will discuss how CIOs are focusing more on high-level business issues and less on technology.

FTC charges ad-meister on the Internet

In its first case targeting advertising on the information superhighway, the **Federal Trade Commission (FTC)** last week charged a Sacramento, Calif., man with making false claims. The FTC charged that Brian Corzine promoted his $99 credit-repair program on the America Online service to advise consumers to take illegal steps to repair their credit records.

Technology continues to haunt NASDAQ

A stock trader's error on a NASDAQ exchange price-reporting system on Sept. 9 led to incorrect prices for at least 30 New York Stock Exchange stocks reported in newspapers across the country that weekend. The error involved a trader's misuse of NASDAQ's Automated Confirmation Transaction system, which in turn led to the inaccurate prices on various stocks, including IBM and Wal-Mart Stores, Inc. These prices were transmitted by a NASDAQ system that distributes price data to The Associated Press. Officials at the National Association of Securities Dealers, which runs NASDAQ, said investors who sold shares that day were not affected by the mistake.

IBM heads up $60 million DOD project

The **Department of Defense** has set up a $60 million project led by IBM that is aimed at developing software standards that would enable U.S. manufacturers to more easily share information with one another when jointly working on programs. Fourteen vendors and universities are also participating, including Digital Equipment Corp. and Texas Instruments, Inc. The government is funding about $27 million of the project cost; the rest will come from the other group members.

Amdahl, Sun bulk up Solaris 2.3

Amdahl Corp. and **Sun Microsystems Computer Corp.** last week introduced A+Edition, an extension to Sun's Solaris 2.3 operating system for mission-critical applications that can nearly double the performance of a Sun 16-CPU system. Available immediately, the A+ software is priced from $1,500 to $2,500 per CPU. Also last week, Sun unwrapped the 64-bit UltraSPARC chip, which is expected to make its first appearance in computers sometime next year.

Forte's high-end tools also priced high

Forte Software, Inc. has started shipping a family of high-end development tools that offer a slew of flashy features, including the ability to develop across hardware platforms. But at $75,000 a pop and with a proprietary fourth-generation language, analysts wondered just who would bite.

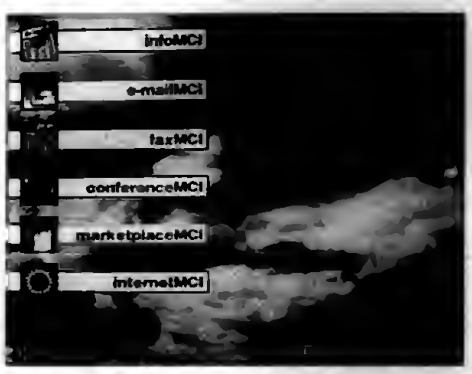
SHORT TAKES Joel S. Engel, vice president of technology at Chicago-based **Ameritech Corp.**, was one of five recipients announced last week for the 1994 National Medal of Technology for his pioneering work in creating cellular communications.... **Software 2000, Inc.** plans to start delivering this week on its promise of object-oriented applications for IBM's AS/400 systems, first in a human resources package.

MCI software opens multimedia world

By Ellis Booker

In a move that industry analysts likened to a shot across the bow of rival AT&T Corp., MCI Communications Corp. last week introduced NetworkMCI Business, a Windows software product bundled with a multimedia public network service.

Introduced at Networld/Interop '94 in Atlanta, NetworkMCI Business includes electronic mail, news feeds, collaborative work tools and integrated Services Digital Network (ISDN)-based videoconferencing. Internet capability is planned by year's end.



MCI's NetworkMCI Business *offers E-mail, ISDN videoconferencing, news feeds and collaborative work tools*

First up

For its part, AT&T earlier this year announced plans to provide many of the same types of features through alliances with Lotus Development Corp. (public Notes servers), intel Corp. (videoconferencing) and Novell, Inc. (LAN-to-LAN access across the public network).

MCI officials noted one key difference: Its service is available for sale today.

Beta user Ken Logue, president of search firm Logue & Rice, Inc. in Vienna, Va., praised the ISDN-based videoconferencing option and the collaborative work capabilities of the package.

"You can see the person you're talking with and have their resume on the same screen for editing," he said.

AT&T officials said the MCI introduction did not alter their timetable for AT&T Network Notes, which is due out by the end of the first quarter next year. They did, however, confirm that they are looking into an "integrated" front end to work with Network Notes and elements of the existing WorldWorx family. The WorldWorx line contains an ISDN-based videoconferencing product.

Like MCI, AT&T hopes to use its platform for services such as online catalogs for retail applications. Two weeks ago, AT&T announced that Egghead Discount Software would begin testing just such an application by year's end using AT&T Network Notes.

No retail

MCI will distribute the $100 front-end software for NetworkMCI Business through its direct and telemarketing sales force. Joe Zuccari, vice president of systems and support for MCI business markets, said there are no plans to sell through retail channels.

MCI's technology partners include PictureTel Corp. in Danvers, Mass., ConnectSoft in Bellevue, Wash., DataBeam Corp. in Lexington, Ky., and Delrina Corp. in San Jose, Calif.

Senior writer Lynda Radosevich contributed to this report.

Ardis readies for cellular network by slashing prices for mobile users

By Ellis Booker and Michael Fitzgerald

■ Ardis Co. will tomorrow announce sweeping price cuts that it said will reduce monthly bills for typical mobile users by more than 25% beginning Jan. 1.

This is the first price reduction in the five-year history of Lincolnshire, Ill.-based Ardis, which was the first to offer a nationwide wireless packet data radio service. Analysts said the action was long overdue.

Ardis has been slow to draw customers, as has its only rival, RAM Mobile Data, Inc. Its pricing move is intended in part to draw customers before the new Cellular Digital Packet Data (CDPD) network, backed by multiple vendors, is finished. The limited commercial CDPD service does not have nationwide service or pricing.

"Ardis has never been a price leader, so this is... bringing their prices in line with RAM and CDPD," said William Frezza, president of Wireless Computing Associates, Inc. in Yardley, Pa.

Ardis executives said the price cuts would boost their user base of 36,000 to 40,000 users in 80 corporate accounts. The company would also like to see its device suppliers and service partners "bring prices down, too," said Rob Euler, vice president of business development at Ardis.

In conjunction with the price cuts, Ardis plans a new product, dubbed Short Message Service, which will be priced at 3 cents for messages of eight characters or less.

Analysts said the price restructuring was logical. "I think they are tired of having to justify their anemic number of subscribers," said Karen Scherberger, an analyst at Gartner Group, Inc. in Stamford, Conn.

She added that the move might even spark a price war in the industry, which was good news for users who perceive wireless data networking as prohibitively expensive.

But Frezza and other observers said a price war was unlikely, given the current high cost of the Ardis service. Ardis expects its price restructuring to result in "several million dollars" in lost revenue but expects to offset the loss over time with added customers, it said.

Price break

Ardis will lower its prime-time message unit charges from 8 cents to 6 cents and per-character charges from 4 cents to 3 cents per 100 characters. Off-peak and monthly minimum usage charges are likewise being lowered. In addition, Ardis cut prices for ServiceXpress, its wireless field service solution, by at least $25 per month per user. And Ardis Personal Messaging will see a 25% increase in the number of message units allowed under various rate plans.

28.8K OPTIMA Modems From Hayes.

Up To Twice As Fast!

Introducing the new OPTIMA® 288 V.FC™ + FAX for the Macintosh® and the new OPTIMA 288B V.FC + FAX internal modem. Like the original OPTIMA 288 for PCs, they all have Hayes® enhanced technology to let you communicate at speeds up to twice as fast as most modems*.

Hayes Modems PREFERRED BRAND Fortune 1000 Companies

V.Fast Class™ technology is at the heart of these new modems. By adding our enhanced V.42bis compression technology, we've been able to increase your speed up to an incredible 230,400 bit/s while ordinary 28.8 modems try to reach 115,200 bit/s. All OPTIMA 288 modems provide great solutions for remote LAN, multi-media, transferring large files, and as an alternative to Switch 56 Service. **And our OPTIMA 288B internal modem has the same COM bic chip (16-bit communications co-processor) built-in as our Hayes ESP® Communications Accelerator to handle these incredible speeds and help prevent data loss.** You can add this technology to any high-speed modem when you buy the Hayes ESP Communications Accelerator for only $99SRP. *And all Hayes 28.8K modems are upgradeable to V.34, providing connectivity to not only the large number of installed V.FC modems but also upcoming V.34 compatible products.*

Gallup Survey Finds Fortune 1000 Companies Prefer Hayes 3 to 1. You will too! Get product and V.34 upgrade details by calling **800-HAYES-28.** Or call our FAX back service *Hayes FAX Response* at **800-HAYES-FX** and select Document 955. In Canada, call **800-665-1259.**

Hayes®

Increasing the Speed of Business.™

*The speed you achieve will be affected by your computer systems, communications software, and type of data being transmitted. To achieve maximum speeds, the new Hayes OPTIMA 288 high-speed modems must be used. **Fastest in four out of five file transfer tests. CRN/The Gallup Organization Inc. 1993 Go *Online With Hayes* BBS, in U.S. call 800-874-2937 or 404-446-6336, in Canada call 800-429-3722. ©1994 Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. Hayes, the Hayes icon, the Hayes logo and ESP are registered trademarks, and the Hayes '302 Escape Sequence Patent icon, Increasing the Speed of Business, ESP Technology icon, OPTIMA, and Smartcom are trademarks of Hayes Microcomputer Products, Inc. V.Fast Class and V.FC are trademarks of Rockwell International Corporation. Other trademarks mentioned are those of their respective companies. Price is in U.S. dollars.

SHL unveils 'push-button' re-engineering tool

By Mark Halper

SHL Systemhouse, Inc. today will move into the age of push-button client/server re-engineering by introducing software that walks managers through business process and application development changes.

The product, called SHL Transform, resides on Unix, OS/2 or Microsoft Corp. Windows NT servers. Organizations redesigning their business processes would disseminate the product on their desktops, said Michele Rebiere, director of business development at the Ottawa-based outsourcer and systems integrator.

Under development for four years, Transform includes text, video and sound presentations of methodologies, instructional programs and a collection of research material, said Rick Beatty, an SHL Systemhouse vice president. The company is charging a license fee of $1,000 per user for methodologies only and $2,500 per user for the whole package.

In what some nonbelievers consider an appropriate pitch, SHL's own product literature acknowledges that "there's a fine line between skepticism and belief."

Tom Nefeldt, data processing manager at Writer's Guild of America West in West Hollywood, Calif., counted himself among the doubters.

While not familiar with Transform in particular, Nefeldt said he questioned the effectiveness of an automated approach to re-engineering — a process that often requires third-party consulting help.

Writer's Guild's Tom Nefeldt: *Can a dispassionate approach to re-engineering offer a fresh perspective?*

"I think you always need a fresh outside perspective," said Nefeldt, whose organization has turned to consulting firm Coopers & Lybrand for re-engineering ideas. "I suppose a dispassionate computer program could give you that perspective, but I'm not sure we want a dispassionate approach."

Happy customers

SHL Systemhouse claims to have already signed on several believers, including the Montreal Stock Exchange, Bank of Montreal and Tupperware Corp.

Pierre Bourassa, assistant senior vice president of MIS at the Montreal Stock Exchange, said he has been using Transform since July to assist some 125 developers in a three- to four-year systems overhaul.

The exchange is slowly moving all its stocks and futures trading activity off a Digital Equipment Corp. VAX and onto Sun Microsystems, Inc. Unix servers running a Sybase, Inc. database and tied to Sun workstations and PCs. It is also developing programs to enhance communications with and among its member trading firms.

"Transform is a huge repository of knowledge on running projects," Bourassa said. "It describes the steps you should follow to develop software, and it's also a hands-on type of training."

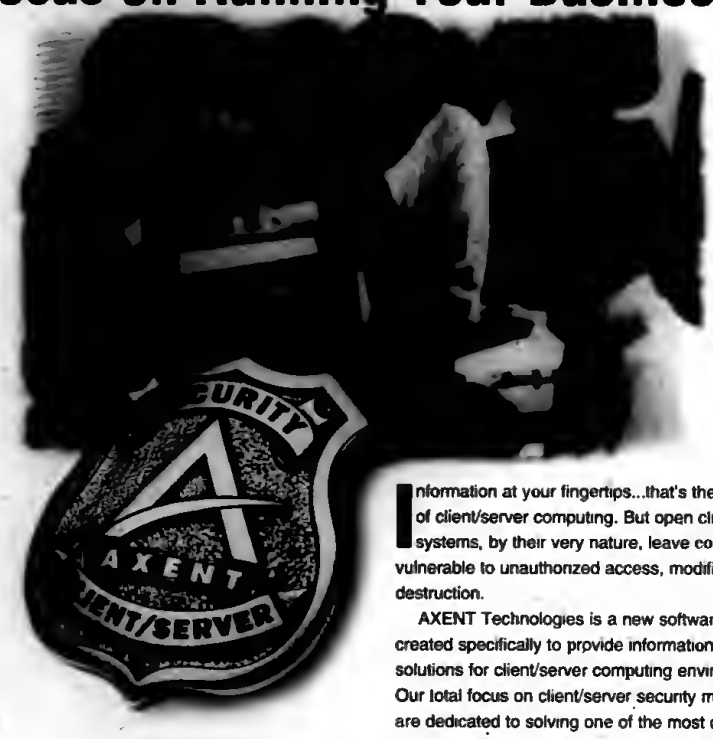
Bourassa said the on-line approach was far superior to old paper-based methodologies because "one subject is linked to another in a logical way, instead of having tons of binders difficult to reference sitting around on a bookshelf."

It is not new for consulting firms to sell paper or automated methodologies — Andersen Consulting offers on-line versions of its Foundation methodology. However, Rebiere claims Transform is the first to integrate methodology with training sessions and research material and to include multimedia sessions.

Mark Hodges, vice president at G2 Research, Inc. in Mountain View, Calif., said he expects to see more integrators and consultants offering automated methodologies and on-line training.

Presenting AXENT™...

Client/Server Security That Lets You Focus on Running Your Business.



Information at your fingertips...that's the promise of client/server computing. But open client/server systems, by their very nature, leave corporate data vulnerable to unauthorized access, modification, or destruction.

AXENT Technologies is a new software company created specifically to provide information security solutions for client/server computing environments. Our total focus on client/server security means that we are dedicated to solving one of the most complicated and dynamic management problems facing information systems professionals today.

The AXENT solutions match the way your environment actually works, with a full range of information security products that operate across personal computers, local and wide area networks, UNIX workstations and servers, mid-range and mainframe computers.

AXENT provides complete, scalable, policy-based security solutions that span technology platforms. That means powerful, streamlined security that lets your company focus on business. Call for your free brochure today: 1-800-298-2620, ext. 102.

AXENT
A Division of Raxco

AXENT Technologies • 2440 Research Boulevard • Rockville, MD 20850

See us at:
NetWorld + Interop, Sept. 12–14, 1994, Booth #264
UNIX Expo, Oct. 4–6, 1994, Booth #652

© 1994 Raxco. AXENT is a trademark of Raxco, Inc. All other products are trademarks or registered trademarks of their respective owners

With so many advanced features in Micro Focus COBOL, there's one you may have overlooked.

The Future.

At Micro Focus, we have a history of ensuring a bright future for our customers.

Fifteen years ago, when the "future" was personal computers, we brought the first true business application development environment to the desktop. Over the years, we built on that foundation by providing the tools and utilities that delivered new levels of productivity to programmers.

Today, we're ready for the next step: Introducing Object COBOL™—the first true object oriented business programming environment.

The Micro Focus Object COBOL Option provides all the functionality you would expect from an object-oriented development environment—including encapsulation, polymorphism and inheritance. It also brings all the benefits of object orientation—reusability, real-world modeling and increased maintainability—to COBOL programmers without discarding existing investments in code and skills.

Object COBOL is shipped with a library of classes for managing collections of objects and for creating Graphical User Interfaces. These classes can be accessed and extended with another Object COBOL component, the Browser.

Object COBOL even extends the COBOL language by letting you define syntax that best suits your business needs. Object COBOL's unique vocabularies make applications easier to read, write and understand... for programmers and end-users alike!

And the best part? It's designed for COBOL programmers, so with Micro Focus, if you know COBOL, you're ready for an object-oriented future today.

For the latest update on this new technology, call 800-MF-COBOL and ask for our white paper: The Object Oriented COBOL Model.

Micro Focus: The past, present, and future of programming.

MICRO FOCUS®

Micro Focus is a registered trademark of Micro Focus Ltd. Object COBOL is a trademark of Micro Focus

Cisco moves to blanket remote-access market

By Stephen P. Klett Jr.
ATLANTA

Cisco Systems, Inc. continued its aggressive attack on the remote LAN access market, launching a product blitzkrieg at Networld/Interop '94 here last week.

The internetworking company — known for its high-end backbone and enterprise routers — unveiled five remote-access product families for connecting mobile and branch-office users to corporate LANs.

The announcement builds on a series of related moves Cisco has made in the last several months, including the release of Integrated Services Digital Network interfaces for its 2500, 4000, 4500 and 7000 series routers and the acquisition of remote-access software provider Newport Systems Solutions, Inc.

The high-volume and low-price sector of the remote-access market represents relatively uncharted territory for the San Jose, Calif., company, observers said.

"We've relied on Cisco for our high-end needs, but its low-end offerings have lacked cost competitiveness and functionality compared to other vendors. In short, its low-end strategy has been woefully inadequate," said one network manager at an East Coast bank who asked not to be named.

"This announcement is very important for Cisco — it really needed to come out swinging," said Charlie Robbins, a vice president at Aberdeen Group in Boston.

Turning failure around

Earlier this year, Cisco acknowledged that it lost out on several potentially large remote-office contracts, including one with Wal-Mart Stores, Inc. Why? High prices and the fact that it really had only one product — the 2500, observers said.

With the announcements, Cisco expects to climb to the top of the remote-access hill. It is also trying to compete with 3Com Corp.'s suite of remote-office products and Boundary Routing strategy, analysts said.

"We've had point products until now with no overall strategy; now we have that," said Kevin Kennedy, Cisco's director of Access products.

Cisco's five new product families include the following:

- **Cisco 1000 LAN Extendors:** A two-port hardware platform with switching software designed for remote offices, which generate limited client/server traffic over a wide-area network link and require only one wide-area connection to a central site. Two models will ship next month priced at $1,595 each.
- **Integrated hub/router versions of the 2500:** Developed with LanOptics Ltd., they combine LAN/WAN routing and wiring concentration. Eight- and 16-port Ethernet versions will ship in November starting at $3,095.
- **Cisco AccessPro PC Card:** A 2500 router on a card for Microsoft Corp. Windows NT Advanced Server PCs. It shipped last month for $1,995.
- **Cisco Access Server family:** A series of four remote-access servers based on the 2500, which let up to 16 users access corporate networks via standard telephone lines. All models will ship next month starting at $2,995.
- **Three new models of the 2500:** They will support two LAN connections each instead of the single connection offered by the original models. They will also ship next month priced starting at $2,995.

LightStream offers backbone ATM twist

By Stephen P. Klett Jr.
ATLANTA

Users who want to implement Asynchronous Transfer Mode (ATM) backbones today but are holding back because of compatibility concerns with their legacy LAN equipment received a shot in the arm last week at Networld/Interop '94 here.

Amid a virtual cacophony of vendors making switch announcements [CW, Sept. 5], LightStream Corp. in Billerica, Mass., unveiled its second-generation, wide-area and campus backbone ATM switch. The LightStream 2020 meshes ATM, Ethernet and Fiber Distributed Data Interface (FDDI) traffic while performing bridging, routing and switching functions.

It will be one of the first backbone switches to provide this mix of functions when it ships next month at prices ranging from $21,700 to $300,000, analysts said.

Ethernet, FDDI and ATM interfaces let users use the 2020 to build an ATM backbone that supports native LAN internetworking. The switch will initially support Ethernet and FDDI bridging and protocol filtering over the wide area. LightStream plans to deliver multiprotocol routing support via a software update in the first half of next year.

"This [product] will serve as a catalyst to move ATM from the domain of the technologists into the corporate environment," said Charlie Robbins, a vice president at Aberdeen Group in Boston.

Observers said the combination of switching and routing assures would-be ATM users that their investments in legacy networking equipment will be preserved.

"Not many users looking to move to ATM today have Ethernet backbones; they have FDDI, and this switch will preserve that investment," said Jennifer Pigg, director of data communications at The Yankee Group in Boston.

Roadblocks ahead

The following constitute the most significant barriers to implementing ATM over the next two years

1. Cost of equipment
2. Interoperability
3. Availability of services
4. Cost of transition
5. Availability of products

BASE: 200 FORTUNE 1,000 COMPANIES

Source: The Yankee Group, Boston

Speed at a price

The LightStream 2020 can forward 64-byte IP packets at a rate of 1.5 million packets per second, according to independent tests performed by Scott Bradner, a consultant at Harvard University's Network Device Test Lab.

But this performance does not come cheap. While pricing for the 2020 starts at $21,700, a fully configured box tops out at $300,000.

Meanwhile, beta users were upbeat about 2020's long-term potential benefits for their networks.

The Health Sciences Center at the University of Colorado in Denver is relying on the switch to transfer 20G- to 60G-byte medical imaging files in its human atlas database. "These files are far too large to be efficiently or cost-effectively accessed over our [FDDI] network. We needed ATM and felt the 2020 offered the highest level of investment protection," said David Weiser, assistant vice chancellor at the office of information systems.

Continental Cablevision in Boston is deploying seven 2020 switches to form the backbone of its network to provide new communications services to its customers. It went with ATM to "future-proof" its network, said Kevin Casey, vice president of engineering. "While standards clearly need work, ATM is the technology that will best position us for the future."

Sybase to offer controlled release of Navigation Server

By Kim S. Nash

Sybase, Inc. last week revealed pricing, hardware requirements and other tidbits about its long-overdue Navigation Server multiprocessing database add-on and vowed to ship a so-called "controlled release" of the product next month to select customers. The real thing is not due until December or possibly January — seven to eight months later than promised.

Navigation Server was announced as part of Sybase's System 10 product line in November 1992 and was supposed to ship by the end of last year. The date was changed in April to mid-1994.

Unforeseen reworking and fine-tuning have run Sybase and development partner AT&T Corp. off the mid-1994 delivery goal [CW, April 11]. Also, Configurator, a companion product designed to automatically set up, monitor and tune Navigation Server systems, will be in beta stages when Navigation Server ships.

In lieu of Configurator, Sybase plans to send support people to sites with Navigation Server. "We will send specialists in with Navigation Server ... to watch [Configurator] for a while and make sure it is making good recommendations," said Terilyn Palanca, Sybase's director of product management for parallel and distributed products.

In a flash

Massively parallel processor setups, with Navigation Server, can speed common database operations, according to Sybase. Updates, for example, became 7½ times faster, and inserts finished 6.6 times faster in tests done at AT&T.

A few large Sybase and AT&T users, such as The Chase Manhattan Bank NA and US West, will receive Navigation Server next month, and Sybase technicians will guide these sites through installation and testing, Sybase officials said.

Chase is due to begin trials of a 250G-byte credit card marketing application next month. The data pool is projected to balloon to 600G bytes, encompassing five years of data on 6 million shoppers, by the end of the first quarter of 1995.

If all goes well with the Unix/Navigation Server combination, the grand plan is to move a marketing system off several IBM ES/9000 mainframes, said Jane Landen, Chase's vice president of bank card services. Test runs in June on 80G bytes of material showed "excellent results," she said.

Navigation Server nutshell

Platform supported*	AT&T 3600 MPP machines
Other requirements	Needs a copy of Sybase SQL Server at every node
General availability	December 1994
Price	$150,000 (4-CPU system); $14,000 for each additional CPU

*IBM, HP and Sun promised for mid-1995

Sybase shoots for more customized support plan. See page 79.

Hewlett-Packard will guide your transition to a new, more flexible computing environment. We've been there a thousand times.

"HP has now established itself as the de facto champion of computer right-sizing."

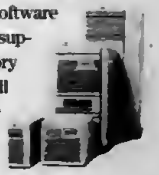
– Summit Strategies, Inc.

Moving to the new world of open computing isn't always a straight-line journey. But more than a thousand of our customers worldwide found the trip much easier than they feared.

They went with HP because we're the leading alternative to mainframes. More mainframe-class applications run on HP 9000 UNIX® servers than on anyone else's. Fact is, as a pioneer in client/server architecture, we've always been out front guiding our customers through the transition. Put it all together, and it's easy to see why we're #1 in UNIX, with high-performance, scalable hardware, software and system management tools.

To show the way to this more flexible computing environment, our Professional Services Organization offers a road map. It will guide the transformation of your present computer systems, protecting your investment rather than scrapping it.

From initial planning and software conversion to training and support, HP knows the territory better than anybody. So call 1-800-HP-KNOWS for more information. We'll get you where you want to go.



HEWLETT® PACKARD

Systems management

SMS debut draws crowds, queries

Corporate role remains uncertain

By Steve Moore

Attendees at last week's Networld/Interop '94 conference flocked to witness the first public demonstration of Microsoft Corp.'s long-awaited Systems Management Server (SMS). Analysts were bullish about SMS, but some users expressed doubts about the complex product's potential role in their organizations.

Previously known as Hermes, SMS will initially support three systems management functions for networked PCs: hardware and software inventories, remote performance analysis and trouble-shooting, and software distribution and installation.

Although pricing was not announced at the show, a Microsoft spokesman later said the SMS server license will cost about $650 and the individual client $50.

Microsoft reputation

"SMS is destined to be big time for two reasons: It's quite a good product, and it's from Microsoft," said James Herman, a principal consultant at Northeast Consulting Resources, Inc. in Boston. Herman singled out SMS' scalability and support of IBM and Apple Computer, Inc. operating systems.

Still, some users took a more pessimistic view. In terms of supporting PC performance management and inventory management for a data-intensive commercial printing operation, "SMS won't come close to doing what I want," said Hank Hensel, network manager at Publishers Printing Co. in Shepherdsville, Ky.

"We've run our routers and NetFrame servers into the ground" in an effort to provide 300 users with rapid access to 1.4T bytes of data across 14 servers and a broad variety of on-line and off-line storage media, Hensel said. "SMS has possibilities, but I can't see it accomplishing what we need for systems management today," he added.

Complex mixture

A user at a Midwestern university who requested anonymity, said, "SMS won't work for me because I have such a mixed LAN environment. It only runs on NT Server, and it doesn't support Unix desktops."

But SMS will be valuable for users whose LAN environments are in flux, said Bob Janusaitis, a LAN technology consultant at Business Systems Group in Houston. "If I'm going to migrate a company from one operating system to another, it would be well worth it to purchase SMS to assist in that process," he observed. But ultimately, "It's all going to come down to what SMS costs," Janusaitis added.

In Microsoft's favor is its strong support of the Desktop Management Interface (DMI) standard, which allows PCs to provide information about their hardware and software to management applications. Microsoft built DMI support into SMS. As a result, Herman said, "Microsoft is positioned to inherit all the advantages that DMI will bring to the industry."

Hermes: A god of high-end servers?

Microsoft's SMS was previously named after Hermes, the Greek god of commerce, eloquence, invention and travel. But after a glance at Microsoft's SMS specifications sheet, users may deem SMS to be the god of high-end server requirements and broadened client options.

SMS runs only on Windows NT Server Version 3.5 or later. It also requires Microsoft's SQL Server Version 4.2 or higher.

On the client side, SMS supports DOS, Windows, Windows NT and Windows for Workgroups, as well as OS/2 and Apple's System 7.

SMS now focuses on three systems management tasks for networked PCs. These include hardware and software inventory, configuration and performance management and software distribution and installation. A Microsoft spokesman said the next key systems management function to be provided in SMS will be software license metering.

—Steve Moore

Legent to add software agents

Product set will aid users in systems management efforts

By Rosemary Cafasso

■ Legent Corp. last week outlined plans to extend its systems management offerings with one of the trendiest things going: software agents.

Called AgentWorks, the product set is intended to help users build and maintain agents as part of their overall systems management effort. The agents — basically small software programs — would monitor network, hardware and software activity based on users' criteria, then send alerts or initiate corrective actions should something go wrong.

But Legent's efforts, according to observers, go beyond jumping on the latest industry fad.

AgentWorks could coexist with the company's bigger systems management framework, called Cross Platform Exchange (XPE) and essentially feed the XPE management tools system activity data. However, the company will offer AgentWorks as a separate product line that does not require XPE products.

Agents at work

Two the five products that make up AgentWorks are the following:

- **System Manager:** Provides a single view of agent data for Hewlett-Packard Co., IBM and Sun Microsystems, Inc. Unix servers.
- **DB Manager:** Provides agents to manage databases, starting with Oracle Corp.'s database management system.

"It's a good move," said Rick Villars, an analyst at International Data Corp. in Framingham, Mass. "The big problem with XPE was getting out of the data center. To really succeed, they need to get into nonstandard Legent customer sites. This technology gives them entrees."

Legent has been working on agent technology for more than a year and shared some development work with IBM on a project called Mercury, which both companies announced earlier this year. AgentWorks is the result of those efforts. IBM will announce products and strategies on its own in the next several months.

Meets functional needs

"It's not there yet in the sense that any beta is not there yet, but it shows promise," said Kathy Nouman, a partner at Price Waterhouse who is evaluating AgentWorks for clients. "It meets most of the functional needs that we had hoped for."

Initially, AgentWorks will consist of five products ranging in price from $5,000 to $12,000. It will be available in the late fall.

WordPerfect unfolds integration plan

By Lynda Radosevich

WordPerfect, Novell, Inc.'s applications group, last week outlined a broad strategy for integrating its electronic mail, document management and forms products. Its goal is to create a set of network components to access NetWare's back-end services via common industry interfaces by the end of next year.

A side benefit for users is less expensive maintenance costs, according to Novell. It estimates that integrating E-mail, document management and forms will save $250 to $400 per node per year in maintenance costs. That is because of common administration, installation and directories.

Mixing it up

Separately, Novell officials also hinted at an upcoming announcement with FileNet Corp. that will link imaging services with NetWare.

Making great plans

Called the Collaborative Computing Environment, the strategy builds on the Open Messaging Environment (OME) plans Novell laid out last March. With OME, Novell promised to integrate Novell GroupWise (formerly WordPerfect Office) and its Message Handling Service (MHS), a messaging transport that works with NetWare, into an open client/server product by the end of next year. The openness would come by using Microsoft Corp.'s Messaging Application Programming Interface and other application programming interfaces.

Last week, Novell added the SoftSolutions document management and InForms forms software to those plans. All the components will natively use NetWare's message transport, directory, license management and other services by the end of next year. Also, they will share a common installation procedure. That should lower the administration costs, Novell officials said.

Users and analysts reached last week were encouraged but underwhelmed.

"It's a strong message and an ambitious plan, and it would be great but lucky if they do it all in that amount of time," said Gary Wilkerson, supervisor of end-user services at Kaiser Foundation Health Plan of Georgia, Inc. in Atlanta.

"That's exactly what they have to do. Anything else doesn't make sense," said David Marshak, a vice president at consulting firm Patricia Seybold Group in Boston. "Their calendaring and scheduling is way ahead of [Lotus Development Corp. and Microsoft products], and their mail is better. But in the integration of document management and forms, they're just catching up," he said.

Novell shipped the first piece of the Collaborative Computing Environment last week, just a few months behind schedule. It is a bidirectional gateway that synchronizes the GroupWise and MHS directories and the NetWare bindery. By year's end, all three will be administered via the NetWare Directory Services in NetWare 4.1, said Stuart Nelson, a Novell vice president of research and development.

In the same briefing, Novell officials hinted that they soon plan to unveil a public groupware network along the lines of the much-publicized AT&T Corp. Network Notes, which AT&T and Lotus announced earlier this year.

LAN Server 4.0 unlikely to make users switch

By Ed Scannell

Addressing past problems, IBM last week formally announced LAN Server 4.0, replete with ease-of-use features and broader Ethernet and Token Ring support. But despite these improvements, some users and analysts said the product still faces an uphill fight against the formidable installed base of Novell, Inc.'s NetWare and Microsoft Corp.'s aggressive pricing strategy for Windows NT.

"We think IBM's product is good, but we are still inclined to work with Novell and fix whatever problems we have rather than switch over," said Judge Fowler, senior vice president and director of systems development at First Union Corp. in Charlotte, N.C. The bank has about 120 servers running on NetWare 3.11 and 3.12. "Unless Novell falls really short with its next offering, we'll stick with them," he said.

Betting big

LAN Server 4.0 remains integral to IBM's client/server strategy. Company officials said last week they will offer industry-standard distributed computing services to deliver Global Directory, Security and Remote Procedure Call from the Distributed Computing Environment in the first half of next year.

While all-IBM information systems shops said they largely like what they see in LAN Server 4.0, they acknowledged that it could be a long battle to persuade upper management to swap out large numbers of NetWare 3.x-based servers. This was true even in those shops with a fair amount of OS/2 on the desktop.

"We would seriously consider converting our NetWare servers over because it eases our configuration problems [with our OS/2 desktops]. But I'd like to see some of the conversion utilities for NetWare [LAN Server] first," said Ken Gable, a senior systems programmer at Amerisure & Cos., a large insurance company in Southfield, Mich. IBM has promised to deliver these tools next month.

Pricing strategy needed

Some analysts said they expected IBM to be more aggressive with its pricing to better fend off Microsoft and its Windows NT. They said IBM must correct this problem in short order if it hopes to win broader acceptance of the product.

"The biggest problem they have is not technical but pricing, given Microsoft's Windows NT. That has got to come down," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington.

IBM has released two versions of the product. The entry version, targeted at small businesses, is priced at $795. The advanced version, designed for corporate accounts, costs $2,295. The price per client is $50.

"There has been no change in pricing. We still believe charging for clients and servers is helpful to customers because it gives the flexibility to build at a rate they are comfortable with," said Susan Rubino, program director for IBM's LAN systems.

However, users might be more comfortable with Microsoft's current pricing for Windows NT Advanced Server — $999 — and the fact that it allows users to add an unlimited number of clients without additional cost.

Both versions of LAN Server feature a new Workplace Shell-like graphical user interface designed to make installation and configuration easier. Users can now use drag-and-drop capabilities to administer all the product's major features and better fine-tune it to their particular networking environments.

Version 4.0 also supports some 200 communications adapters, including most popular Ethernet and Token Ring adapters, according to the company.

No matter what types of digital transmission services are available in your area, Motorola has datacomm products available to deliver an end-to-end solution.

Motorola digital products are interoperable across operating systems and platforms using a multitude of leased or switched services. Video conferencing, high-speed file transfer, Group IV fax, PC-to-host connectivity, LAN-to-LAN communications, disaster recovery and a host of other applications are now available to you. And, with product features like network management, restoral alternatives, integral multiplexing and synchronous data compression, you get the best performance from these services.

For terminal adapters, network termination units or DSU/CSUs, you can now enjoy the convenience and confidence provided by a single source. This family of digital products is part of a total Motorola data communications solution from UDS and Codex that also encompasses analog communications, remote access, mobile communications, network management, and more. For details, call your distributor or contact us, today!

800/766-4883

MOTOROLA

Novell bids

CONTINUED FROM COVER 1

lines. With the clock ticking, Frankenberg is not wasting any time. At the Networld/Interop '94 conference last week in Atlanta, he gladdened the hearts of customers with his apparent readiness to trim the organizational fat and willingness to rapidly withdraw from fruitless battles against Microsoft in the desktop arena.

Furthermore, the rookie CEO's first take on a long-term product strategy was pretty much on target, analysts and users said. Frankenberg spent the past few months visiting some 115 customer sites to learn what they expected from Novell.

Customers can also expect to be dealing with a smaller Novell in the future. During recent analyst briefings, Frankenberg said that up to 650 more employees would be laid off by January in addition to the 1,100 he trimmed last month. He did not indicate that further major reductions were in the works, "although he left the door open," said Mary McCaffrey, a principal at investment company Alex. Brown & Sons, Inc. in New York.

Frankenberg's next major announcement, expected within the next week or two, will lay out the leaner organization designed to move the company into the next generation of its distributed computing strategy.

The organization will shrink the current 19 business units to 12, with one education, one support and 10 product units divided into four overall groups, Frankenberg said.

Each group will be a separate profit and loss unit and will make its own alliances with third parties. The organization bears more than a passing resemblance to Frankenberg's former employer, Hewlett-Packard Co.

One often-voiced demand from customers has been for the company to return to its NetWare roots instead of expending its forces on fruitless projects such as trying to beat Microsoft in the desktop operating system arena, Frankenberg said in an interview last week with *Computerworld*.

Frankenberg maintains that his strategy — dubbed Pervasive Computing — is a direct response to those demands. The strategy extends the NetWare infrastructure, ensuring it can reliably and transparently provide strategic clients with access to information residing on local or remote UnixWare or NetWare servers or even across the Internet. The types of client machines will range from next-generation Windows 95 desktops to personal digital assistants.

Do the following initiatives make Novell more able to meet your company's client/server and enterprise network computing needs?

	More able	No change
NetWare 4.1 with its Global Directory	[illegible]	[illegible]
WordPerfect acquisition	[illegible]	[illegible]
UnixWare	[illegible]	[illegible]
Visual AppBuilder (Fifth-generation application development environment)	[illegible]	[illegible]

Base: 209 Novell users

Source: *Computerworld* Database Division, Framingham, Mass.

Such a strategy is the right one for the network operating system vendor, said Craig Burton, chairman of Salt Lake City-based consultancy The Burton Group. Novell is a company whose "opportunity lies in building the [networking] infrastructure and technology [to support] . . . the virtual corporation," Burton said.

Frankenberg acknowledged that an initial challenge is for Novell to start meeting product deadlines, particularly for crucial offerings already badly behind schedule. These include the following:

- **NetWare 4.1**, the first full-function version of Novell's enterprise network service platform. It is now slated for early December delivery.
- **UnixWare 2.0**, said to be the first viable version of Novell's application platform. It was due last summer but recently slipped another month to January 1995.
- **Visual AppBuilder**, the fifth-generation client development architecture due out last spring and expected to ship this week.
- **Promised UnixWare support of NetWare 4.1 services**, particularly NetWare Directory Services and the NetWare Distributed Management Services. That integration is now slated for later in the year, following the UnixWare 2.0 release, said Novell Executive Vice President Kanwal Rekhi.

Yet another challenge looming for Novell is beating out Microsoft in the distributed computing platform sweepstakes. Microsoft's advantage boils down to users seeing a top-quality application platform as a much more crucial element of their distributed computing architecture than a great set of enterprise networking services, said Rick Villars, an analyst at International Data Corp., a research firm in Framingham, Mass.

Missed chance

"In my particular shop, if Novell brought NetWare 4.x out, and had 4.x done what they said it would do . . . we might have stayed where we were [with NetWare]," said Ed Hiller, data processing supervisor at Little Rock Wastewater Utility in Arkansas. "We would have just gone with a Windows environment on top of Novell."

Bankers Trust, for example, is seriously thinking of migrating its 600 to 800 NetWare 3.x servers to Windows NT, according to Joe Schwartz, a consulting software engineer at the New York bank. Even if moving to NT means a 20% decrease in file and print server performance, that could be justified by the advantages that Daytona — Windows NT 3.5 — offers as a scalable, easily administrated application platform, he added.

Novell plans to counter the Daytona threat with its so-called SuperNOS initiative, which will integrate NetWare networking services with the UnixWare application platform sometime next year, Frankenberg said.

For 1996, Novell is promising a fully scalable, distributable, microkernel-based platform that will combine UnixWare and NetWare on the same box. However, that platform will likely be too late to hold on to companies such as Bankers Trust.

One of Frankenberg's major projects is to try once again to rally the Unix industry around UnixWare, which Novell acquired from Unix System Laboratories, Inc. in 1993 as Unix System V Release 4.0. UnixWare shipped about 35,000 units in 1993 and should ship about twice that number this year.

The plan includes making the Novell extensions to UnixWare modular and then offering to support the more useful of other vendors' extensions to Unix, he said.

Frankenberg also faces the task of convincing analysts and customers that Novell's recent WordPerfect acquisition adds significantly to the company's ability to serve the future client/server needs of corporate users.

Some analysts question how Novell can present itself as both an application suite vendor and a purveyor of the "open" Visual AppBuilder architecture for linking client applications to NetWare-based services. The same question has been asked of Microsoft, given its dual role as an application and system software provider.

Frankenberg denied that any but a few leading workgroup and messaging back-end vendors, such as Lotus Development Corp. and Microsoft, would be put off by Novell's ownership of WordPerfect.

Computerworld *Editor Paul Gillin contributed to this article.*

Beta users applaud Lotus' Organizer improvements. See story page 43.

NT honed

CONTINUED FROM COVER 1

such as improved scalability on multiple-processor machines and native 32-bit TCP/IP support — to make that break.

That is where the alliance partners come in. For example:

- AT&T Global Information Solutions is developing networking software that will let Windows NT coexist as a peer with Unix and OS/2 servers, said Bob Kruger, Microsoft's director of strategic relations and standards. The Santa Cruz Operation and other Unix vendors will ship versions of that product, called Advanced Server for Unix, next year, Kruger said.

Also, AT&T GIS last month said it will implement clustering for its NT-based machines and will port its transaction processing monitor software to NT.

- Digital Equipment Corp. is preparing Distributed Computing Environment support for NT and the Common Object Model gateway technology between Microsoft's object technology and Digital's implementation of the Object Management Group's Common Object Request Broker Architecture standard.

Digital is also working on NT clustering for its own machines, said Rich Tong, Microsoft's general manager of corporate and network systems.

- Unisys Corp. announced last spring it will port its X/Open Co.-compliant on-line transaction processing system to NT.
- Several other companies are working to provide additional TCP/IP implementations for NT.

"There are also a whole slew of companies doing X Window [System] clients and servers" for NT, Kruger said.

Berst compared Microsoft's strategy to the Allies' approach to peaceful coexistence with the Soviet Union. Microsoft is saying, "We'll cooperate with you to partition Germany and Berlin, but meanwhile we'll move our missiles up to the front lines," he explained.

Ahead with Unix

Already NT is making inroads into the Unix environment.

"We have a major Oracle database that we use for all of our satellite data sources," said Briscoe Stephens, coordinator of space sciences in the advanced scientific information systems group at NASA in Huntsville, Ala. "Right now it's on [an IBM] 3090, but we're moving it to NT. We're also stamping out [Digital] VAXs. We can buy half a dozen [NT] boxes for less than the maintenance costs" on a mainframe.

"The number of NT boxes will supersede the number of Unix boxes pretty soon," said Daniel Willis, lead analyst at 3M Co.'s information technology group in Minneapolis. However, Kruger said he expects to have a coexistence strategy with Unix servers for the foreseeable future and that Microsoft understands it will never eliminate Unix in enterprise environments.

"The number of NT boxes will supersede the number of Unix boxes pretty soon."
Daniel Willis
3M Co.

Part of the motivation for some users to move more critical systems to NT from Unix is the constant quest to decrease computing costs.

In the long run, Microsoft's strategy means users will win, even if they buy server technologies from competitors.

That is because Microsoft is driving down prices, said G. Pascal Zachary, author of *Showstopper!*, a book on NT's genesis that will be published next month by Simon and Schuster.

I CAN'T AFFORD TO TAKE RISKS.

I NEED MIDDLEWARE THAT'S OPEN, POWERFUL AND SCALABLE.

☐ Please send me your FREE White Paper "Migrating to Client/Server - A Case for Middleware".

My company uses the following:

☐ IBM MVS, VM/CMS ☐ DOS
☐ IBM AS/400 ☐ OS/2
☐ Digital VAX/VMS ☐ Microsoft Windows
☐ Hewlett-Packard ☐ Apple Macintosh
☐ Wang VS ☐ UNIX
Other _____

I'm planning to purchase a middleware solution in:

☐ 1-3 mos. ☐ 3-6 mos ☐ 6-12 mos.

NAME TITLE/DEPT

COMPANY

ADDRESS

CITY STATE ZIP

( )
TELEPHONE

DATABASES USED

Information Builders

CALL 800-969-INFO
In Canada Call 416-364-2760

Printed in USA

CW91994

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT 1305 NEW YORK, NY

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN: Product Information Center
Information Builders
P.O. Box 1461
New York, NY 10117-1484

Although [illegible] they provide [illegible] have disastrous [illegible]

Other vendors provide [illegible] **EDA/SQL** from Information Builders [illegible] the flexibility to set your own standards [illegible] computing. And **EDA/SQL** guarantees that [illegible] any database both relational and legacy [illegible] platform.

This means that you can [illegible] the way you want [illegible] accurate data to your workstation [illegible] And [illegible] **Smartmode** technology lets you control [illegible] queries before they [illegible] application [illegible]

Bottom line? **EDA/SQL** gives you the freedom to [illegible] systems that deliver accurate data to the manager [illegible] matter what form it's [illegible] where it resides. [illegible] unbeatable price performance ratio. No wonder more than 500 customers already enjoy [illegible] successful [illegible] implementations.

So before you make a decision that's sort to [illegible] **EDA/SQL** [illegible] your choice.

For more information to attend a **FREE** seminar or to receive a **FREE** White Paper "Migrating to Client Server: A Case for Middleware"

CALL 800-969-INFO

Information Builders

ISO 9001
CERTIFIED

All the best rides onto the network are brought to you courtesy of AT&T Paradyne. With the broadest range of access products in the world. And with backup as big as AT&T itself. Backup like NetCare,® the program that may well be the most comprehensive after-care service ever offered. By anyone. Anywhere. As for interconnectivity and future migration, no one gives you a better entree to the networks of tomorrow than AT&T Paradyne. It's access as only AT&T can do it.

Access the Globe.

For access, access and more access, call 800 482-3333, extension 320.

AT&T Paradyne

©1994 AT&T. NetCare® is a registered service mark of AT&T

Digital signal processors to ease, boost upgrades

By Michael Fitzgerald

Ronco, the company that gave us the advertising slogan "But wait, there's more!" has nothing on the makers of digital signal processors (DSP).

These specialized, software-driven chips can combine fax, modem, audio card and other features in one package and can be programmed to do other tasks as well.

A new generation of DSPs has started appearing on the market, and analysts say more DSP-based products will arrive throughout the fall, embedded on motherboards and in a flush of add-in cards. Users say DSPs could eventually save them money and make upgrading hardware peripherals much easier.

DSPs "absolutely look to save us money down the line," said Fred Zickert, manager of microcomputer support at Eaton Corp in Cleveland. Zickert cited software programmability and upgradability as DSP functions he thinks would work well for Eaton.

DSPs are math-intensive chips that can be programmed to operate as a multitude of peripheral devices largely having to do with audio signals, such as modems and sound cards. Compression and speech recognition functions are possible directions for DSP makers, perhaps by late 1995.

"For the installed base of PCs, the programmable chip is a godsend," said Will Strauss, an analyst at Forward Concepts, a market researcher in Tempe, Ariz.

The market also appears to have Microsoft Corp.'s blessing in the form of the DSP Resource Manager interface, a programming interface built into the next version of Windows, Windows 95.

Out and up

The DSP market overall is expected to grow significantly in the next three years. Forward Concepts projects it will grow from 6.6 million units this year to 16.5 million units in 1997.

Today, Hewlett-Packard Co. will announce OmniShare, a product that leverages AT&T Paradyne's DSP-based VoiceSpan technology. It lets users share documents while talking on the phone.

Last week, Spectrum Signal Processing, Inc., a Burnaby, British Columbia, firm, began shipping a version of its OfficeFX fax/modem card that uses IBM's MWave DSP to simultaneously function as a sound card. The product costs $349.

"This means you can have your fax running while you're running audio" on your PC, said Barry Jinks, Spectrum Signal's president.

New beginnings

"This could be the start of a burgeoning market," said Phil Lapsley, an analyst at Berkeley Design Technology, Inc., a DSP consulting firm in Fremont, Calif. "For the consumer, you buy one card and it fills the function that several ISA cards currently do."

Lapsley said, however, that DSP market growth might be stunted if the industry cannot clear certain hurdles, such as producing faster DSPs to run resource-intensive next-generation modems. Another potential problem is that DSPs work with static RAM, not the less expensive dynamic RAM most chips use. Also looming is the shadow of Intel Corp., which is likely to build modem and other DSP-type functions onto future processors.

Strauss downplayed these challenges, saying that today's DSPs are capable of handling the new V.34 modem standard. In addition, "more sound board and modem control functionality will migrate to the CPU, but data pump functions and things that have to do with really compute-intensive tasks like video compression and encoding will [not]," he said.

Time will tell, but the potential for a third-party application market targeted at DSPs could make life good for people who never get enough features.

INTRODUCING MANAGED MIGRATION.
ONLY FROM RACAL-DATACOM.

If you're migrating from host-based to client/server, you know parallel networks are for the birds. They're a clumsy, costly solution for allowing your remote LANs access to your legacy system data. Until now, though, there's been no safe, cost-effective alternative.

Racal just solved the problem. With Managed Migration. Safe, sure passage between host computing and LAN environments.

The key to Managed Migration is our Excalibur® Access Node (EAN™) 2000, first in a series of new Excalibur products that enable reliable, secure transport of mainframe business applications and LAN-based applications. That could reduce your monthly circuit charges by 50 percent.

EAN 2000 integrates Excalibur's #1 DSU/CSU technology with Wellfleet® leading-edge router technology into a single, dual-purpose product. So you need fewer pieces of equipment at the remote site. Naturally, EAN 2000 is remotely manageable via SNMP. And managing one network instead of two parallel networks yields more savings in time and manpower.

You'll find all the features you're looking for, too. Like support for all the major protocols and WAN access services, up to four ports for legacy mainframe applications, and interoperability with existing Excalibur DAPs and Wellfleet routers.

In short, everything you need to survive client/server migration. Racal's EAN 2000: an investment that'll really fly. For more information call 1-800-RACAL-55.

©1994 Racal-Datacom, Inc. All rights reserved. (9/94-0877)
Racal-Datacom and EAN 2000 are trademarks of Racal Electronics Plc. Excalibur, CMS and LANDAP are registered trademarks of Racal-Datacom, Inc. Wellfleet is a registered trademark of Wellfleet Communications, Inc. All other registered and unregistered trademarks shown are the property of their respective owners.

RACAL
Communicating through technology

High performance 486™DX2. Blazing 66MHz, backed by our exclusive turbo cache, for unparalleled workstation performance

Two Full-length ISA Slots. Connections are everything. And this machine allows for plenty—Ethernet, video, you name it.

Optional Built-in 5.25" CD ROM. The medium with capacity for video clips, graphics, photo CDs, or an entire set of manuals.

PCMCIA Expandability. The T6600C offers a huge wealth of communication and expansion options, including a 16mm PCMCIA 2.01 compliant slot large enough for a hard drive!

Built-in Stereo Speakers. Quality audio adds another dimension to any program. With Microsoft® Microphone™ included, your work can speak for itself.

A technological tour de force that actually tours.

Take your entire show on the road. The Toshiba T6600C Series represents the most advanced technology and muscle we've ever put into a portable. With its 486™DX2 processor, dual ISA full-slot expansion, and huge storage options, the T6600C Series delivers the power and capacity for the most demanding portable applications. From network analysis to software development to full-blown multimedia, if you need to tour with a great deal of force, this is your system.

Feel the force. **For your nearest dealer, call 1-800 457-7777.**

The T6600C Series

- Intel 486™DX2/66MHz
- 8MB RAM expandable to 40MB RAM
- 10.4" color active matrix TFT-LCD screen
- SVGA display with 640x480x256 color resolution
- 510MB HDD
- Two full length 16-bit ISA slots
- One 16mm PCMCIA slot
- Built-in SCSI with external SCSI-II port
- Microsoft® Sound System™
- 5.25" half height 200ms double speed CD-ROM (T6600C/CD model only)

intel inside

In Touch with Tomorrow

TOSHIBA

© 1994 Toshiba America Information Systems, Inc. The Intel Inside logo is a trademark of Intel Corporation. All products indicated by trademark symbols are trademarked and/or registered by their respective companies.

Check heat
dissipation of the PC
model to be sure it is within
the required specifications
Ensure system design is
capable of maintaining
proper temper
atures.

Measure the
dimensions around
the OverDrive processor
socket. Be certain socket
is accessible and allows
the OverDrive proces-
sor to be readily
installed.

To verify upgradability, look

There are two ways you can check if a new PC is upgradable with a future Pentium™ OverDrive™ processor. Run it through a comprehensive battery of tests yourself. Or look to the Intel Verification Lab to do it for you.

Upgradability is a great way for you to extend the life of a PC. But it presents a challenge because computer manufacturers have to make PCs ready for an upgrade processor before that processor is even available. That's why PC manufacturers are working together with Intel to make sure their latest PCs are CPU upgradable.

First, Intel gives manufacturers the advance specs for future Pentium OverDrive processors. Then, the manufacturers incorporate the specifications into their designs and send their PC models to Intel for a series of upgradability tests.

The result is the *Intel Verified: System Selector,* our list of

© 1994 Intel Corporation

Insure that the OverDrive processor socket draws the right amount of electrical current. Also, make sure voltages and timings are within specified parameters.

here. Or here.

systems which meet Intel's minimum design criteria for upgradability with a future Pentium OverDrive processor. It's the place to look for CPU upgradability you can count on. For a free copy and more technical information, call 1-800-395-7009, Ext. 212.

intel®

FOR PENTIUM™ TECHNOLOGY UPGRADABILITY, LOOK FOR **Intel Verified:** Upgradable SYSTEMS FROM THESE PC MANUFACTURERS.

- ACER INCORPORATED
- ADVANCED LOGIC RESEARCH
- AST RESEARCH
- AT&T GLOBAL INFORMATION SOLUTIONS
- COMPUTREND SYSTEMS
- DELL
- DIGITAL EQUIPMENT CORPORATION
- FIRST INTERNATIONAL COMPUTER, INC.
- GATEWAY 2000
- HEWLETT PACKARD
- IBM CORPORATION
- INTERGRAPH COMPUTER SYSTEMS
- IPC CORPORATION LTD.
- MICRON COMPUTERS
- NEC TECHNOLOGIES INC.
- PACKARD BELL
- UNISYS CORPORATION
- VTECH
- ZENITH DATA SYSTEMS
- ZEOS INTERNATIONAL

AND MANY MORE . . .

Execs question info highway security

By Gary H. Anthes
WASHINGTON

Given the Internet's lack of security, intellectual property protection and ease of use, using the so-called information superhighway still presents daunting hurdles for many business users.

That was the underlying message at a recent conference here sponsored by the White House and the private-sector Council on Competitiveness.

"We are bound to run into some obstacles," said U.S. Department of Commerce Secretary Ronald H. Brown. He released a report by the president's Information Infrastructure Task Force that outlined potential benefits of the National Information Infrastructure (NII) in eight industry sectors, including electric power distribution, transportation and law enforcement.

The NII's greatest challenges may be those that exist in the corporations that are would-be superhighway cruisers, some attendees said. "The barriers are not so much technological or even financial; they are cultural — ignorance, dogma and resistance to change," said Jim Manzi, chairman and chief executive officer of Lotus Development Corp.

Dan Schutzer, director of advanced technology at Citibank NA, said two issues concern would-be users of electronic commerce. "First and foremost is security," he said. "How do you authenticate users in real time?"

Further challenges

Search and navigation is the second challenge, according to Schutzer. "How do you find things, and how do you know what's important?" he asked. "We will have information paralysis if we don't handle this carefully."

Several people blamed old-fashioned management hierarchies for blocking networked collaboration within and among companies. "The vertical structure within organizations is an impediment," said Carol Christian, a professor of astrophysics at the University of California at Berkeley.

"Either upper management commits but does not translate down, or the lower levels are enthusiastic but upper management is not committed," said Christian, who is also project manager of a government-sponsored NII pilot project devoted to global environmental change.

The future of commercial systems architecture is developing right here.

Distinguished speakers include

TRI-Ada '94 Conference & Expo Baltimore, Nov. 7–11

Free CD-ROM
All registrants receive a free Walnut Creek CD-ROM containing 500MB of source code, compilers, Ada info and training aids.

Featured are

TRI-Ada '94 has emerged as the foremost technical conference on computing and software engineering no matter what language you use — C++, Pascal, Smalltalk, FORTRAN, or Ada.

You'll find more than 50 intensive workshops and tutorials on client/server and distributed environments, object-oriented development, software process improvement, business process re-engineering, and other crucial issues.

Learn more about

Ada
The Language For A Complex World

For more information call
1-800-833-7751
or (508) 443-3330
Fax (508) 443-4715

You'll hear some of the world's foremost experts in large, distributed, parallel, time-sensitive, and fail-safe systems.

You'll see what's new in CASE-related products and services.

And you'll learn why hundreds of commercial developers are switching to Ada for large and complex systems, as well as fail-safe systems, and systems that are subject to change.

0011001

Anyone concerned with sharpening their competitive edge in a rapidly changing technological world should not miss TRI-Ada '94.

TRI-Ada '94
GOVERNMENT • INDUSTRY • ACADEMIA

Or fill out and mail this coupon.

TRI-Ada '94 Conference & Expo. Baltimore, MD, November 7 - 11.
Send me your advance program including agenda, list of tutorials, speakers, exhibitors, as well as registration fees and travel information.

Name
Title
Company
Address
City State Zip
Business Phone ( )

Mail to: TRI-Ada '94
c/o Danielt & O'Keefe Associates, Inc
490 Boston Post Road, Sudbury, MA 01776 CW

Surfing for sales on the Internet

While some users sit on their hands fretting over obstacles to electronic commerce, department store chain Nordstrom, Inc. is on the move.

This week, the company will launch a service through which shoppers anywhere in the U.S. can order merchandise by sending electronic mail to a team of specialists at the Seattle store.

"We don't have a clue whether it will work or not," said Randy Rehn, information express manager at Nordstrom. "It's kind of scary."

However, Nordstrom has reduced system risk by choosing tried-and-true technology. E-mail will be provided by MCI Communications Corp.'s decade-old service, and products will be delivered by Federal Express Corp.

Although Nordstrom's MCI Mail account — "Nordstrom PT America" — can be accessed via the Internet and other E-mail services, direct access via MCI Mail is secure enough to allow the transmission of unencrypted credit card numbers, Rehn said. — *Gary Anthes*

FREE LOTUS NOTES CD-ROM OR LOTUS NOTES DEMO DISK.

Find out how Notes can help you build more productive workgroups. Please fill out and return this reply card or call 1-800-828-7086, ext. A217

Get the new Lotus Notes CD-ROM—a comprehensive introduction to how Notes can work for you. Or check the box for the Notes Demo Disk.

☐ FREE NOTES CD-ROM, including:

- Lotus Notes auto-demo
- Notes guided tour
- Notes stand-alone client: a working model complete with sample databases
- Full electronic documentation.

☐ NOTES DEMO DISK.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Daytime Phone _____

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 9215 SALT LAKE CITY, UT

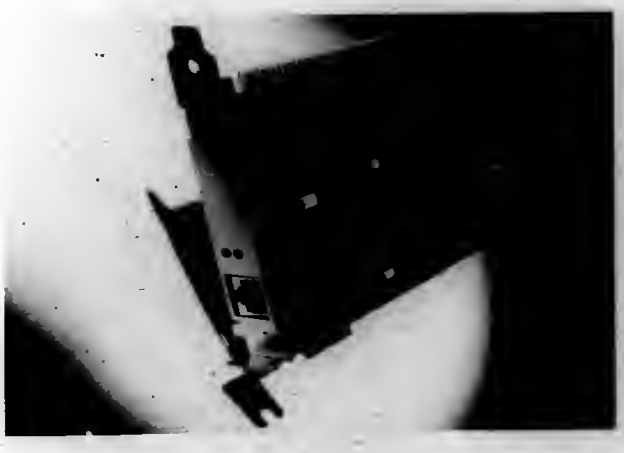
POSTAGE WILL BE PAID BY ADDRESSEE

LOTUS NOTES OFFER
LOTUS DEVELOPMENT CORPORATION
P.O. Box 31602
Salt Lake City, UT 84131-9959

you are the
architect
of your
greatness,
engineer
of its potential.
you want
to build
something
remarkable.
you
COULD USE
some
new
TOOLS.
Here's
how TO
make it
HAPPEN.
Lotus

The quickest way to get Compaq® communicating with Dell™

is with the new, easy installing Token-Ring *Adapter from IBM.*



This is a brand new IBM Token-Ring Adapter, and it not only works with virtually any PC on your LAN, it has features you can't get anywhere else, at a price you flat-out won't believe.

For example, you'll never have to set switches for ring speed or cable type again. Our new adapter configures itself automatically, both at installation and later on if something changes. Plus it has handy LED status indicators, and it's the only Token-Ring client card that's full duplex enabled, more than fast enough for multimedia.

And the price? Well, let's just say we took an ax to our old price and lopped it off not too far above the middle. You get the idea.

To learn more about the Options™ by IBM Token-Ring Adapter, call 1 800 IBM-3395 and key in ID#11460. To order, see an authorized reseller or your IBM marketing rep.

The new IBM Auto 16/4 Token-Ring ISA Adapter. For Dell, for Compaq, for Gateway 2000®, for IBM, for peanuts.

IBM.

Refer to minimum system requirements. Some configurations may not be compatible. This warranty is not transferrable by end-user/customer. Copies of IBM's statement of limited warranty are available upon request by calling 1 800 722 2227. Dealer prices may vary. Options by IBM is a trademark and IBM is a registered trademark of the International Business Machines Corporation. All other products and/or company names are trademarks or registered trademarks of their respective companies. © 1994 IBM Corporation.

HP keeps pace in PC race with aggressive price cuts

By Jaikumar Vijayan

Hewlett-Packard's Personal Information Products Group, which has emerged as one of the fastest growing companies in the PC business, will today take aim at industry price leadership with the announcement of a series of price reductions across its desktop lines.

Effective Oct. 1, prices on all HP Vectra models and several of its multimedia PCs will be reduced between 5% and 20%. For instance, an HP Vectra VL2 4/66-MHz model — with 340M bytes of disk and 8M bytes of RAM for a list price of $2,249 — will now cost $1,839.

The pricing changes will make HP competitive with other leading vendors such as Compaq Computer Corp. and IBM PC Co., although HP claims its price tags are lower than the others by 10% to 15%. The action comes at a time when PC sales have been booming for the company. HP recently shipped its one-millionth PC for the fiscal year, has been doubling its PC shipments every year and recently propelled itself into the Top 10 of the PC business.

"We are absolutely a growth engine for HP," said Jacques Clay, general manager at HP's PC division, last week. The PC business now ranks among HP's Top 3 business lines — up from nearly nowhere two years ago.

HP's plans call for strategic moves into the small office, home office and consumer markets, with products targeted specifically at those segments.

Possibly contributing to HP's gains were the supply problems that plagued other PC vendors such as IBM and Compaq during the past few fiscal quarters, analysts said. In fact, erratic product availability — particularly from the second quarter of 1992 into the last quarter of 1993 — probably allowed HP to establish a comfortable beachhead in the PC market, said Randal Giusto, a senior industry analyst at BIS Strategic Decisions in Norwell, Mass.

Yet as HP gets more into consumer and small business user markets, it will also have to get into traditional retail distribution channels and position itself as a serious desktop player, observers noted.

Hewlett-Packard

CONTINUED FROM COVER 1

ecutive officer in 1992. "We're never absolutely, totally satisfied with how we're doing. We always imagine we could be doing better, that the competition is catching up with us."

Some analysts said they believe HP is still relying on good product hunches about RISC, Unix and desktop printers made in the late 1980s. "They're riding the crest of a lot of good decisions that were made in the past," said Bill Moran, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

"The jury is out on some decisions they're making now because they have implicitly conceded they can't go forward with PA-RISC forever," he added.

Even though HP plans to release a full 64-bit PA-RISC 8000 chip in 1996, it will sell the 32-bit PA-RISC 7200 next year, as competitors such as IBM and Sun Microsystems, Inc. start selling 64-bit hardware, analysts said last week.

Navigating the installed base to an entirely new post-RISC platform in the late 1990s could be problematic, analysts said. HP's alliance with Intel Corp. to develop a microprocessor within four years — combining elements of both HP's PA-RISC designs and Intel's CISC Pentium chips — will not yield products until the late 1990s.

Heads up

In the meantime, HP must avoid bumping heads with systems integrators that are also business partners. In January, HP launched an outsourcing group; in the spring, it created a 4,000-member systems integration operation.

One way HP executives avoid surprises is to stay in close touch with the user base. To that end, the company holds seminars for the senior executives at customer sites and hosts teleconferences with hundreds of users simultaneously. Bernard Guidon, general manager at HP's Workstation Systems Group, said last week that HP's Advisory Council of top users worked so well at providing feedback that the process is being "cloned" to work on regional and local levels.

Analysts also noted that HP has been masterful at keeping users of its 60,000-plus proprietary HP 3000 midrange servers happy, even as some sites move to Unix systems.

Increasingly, HP is letting users provide feedback for product development. "They're learning how to handle the customer as well as being handled by the customer," said Ed Riedy, a manager at GTE Telephone Operations' information management group in Tampa, Fla., which has hundreds of HP Unix servers and a dozen IBM-compatible mainframes. "They're listening to us and reacting to us and providing special components, as needed," he said.

Boost in sales

So far, HP's business in printers, PCs and Unix systems is growing apace (see chart). Even the HP 3000 line has slightly increased sales. Yet HP is looking to expand its market share by targeting the installed bases of Sun Unix workstations, IBM AS/400s and Digital VAXs.

Microsoft Corp.'s Windows NT is also a possible draw for new customers. Although HP already offers NT — on its PC servers — the question is whether adding an NT port to HP 9000 Unix servers would add value, said Wim Roelandts, senior vice president and general manager at HP's Computer Systems organization. Also, he estimated it would take 30 to 50 engineers working full time to support that port.

On track

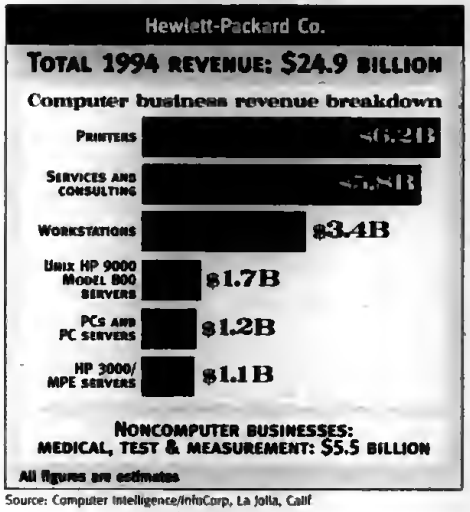
In the more esoteric realms of the business, HP uses its research labs to track new technologies for products. That approach leaves the vendor well-positioned to combine its expertise in hardware and communications to create a wide array of hardware appliances for the so-called information highway, said CEO Lewis Platt. Among such possibilities are printers that capture video images from TV set-top devices or handheld scientific devices that relay field data to corporate servers.

Meanwhile, HP is angling to grow its customer base. It sold more than 1,000 of its year-old HP 9000 T500 Corporate Business Servers as part of a "mainframe alternative program" that targets mainframe sites with Unix servers. It has sold many more Series 800 servers as downsizing platforms.

The company has come on aggressively in X Window System terminals as it seeks to unseat Network Computing Devices, the worldwide leader in unit shipments. HP said it would also like to unseat $4.6 billion Sun with HP's $3.4 billion Unix workstation business. To grab a share of IBM's AS/400 base, HP is lining up software vendors to port AS/400 packages to HP servers.

Despite recent successes, past troubles are remembered. There was the early but bumpy transition to RISC technology in the mid-1980s and then the trimming of HP's multilevel bureaucracy in the early 1990s. The last reorganization was carried out with direct assistance from co-founder and theo-chairman David Packard, whose 1950s-era office is still located at HP's corporate headquarters here, next to co-founder William Hewlett's. After some initial trimming, head count climbed to 96,200 last year and is presently at 97,900.

The current crop of HP executives remember the company's "burnt fingers" over the issue of migrating users from the complex old-style CISC chips to PA-RISC, Roelandts said. "We moved in the mid-1980s, and it took us five years," he explained. "It's not enough to have the hardware, it's a lot of work."



Source: Computer Intelligence/InfoCorp, La Jolla, Calif

Although HP acquired Apollo Computer, Inc.'s workstation business in 1989, HP is still gently pushing those users to move to HP Unix workstations. But a stubborn and steady preference for Apollo-style text editing and distributed computing has bogged down those efforts.

Good returns

Still, these days the long-term investment is paying off — at the rate of $250 million a quarter in Apollo-to-Unix migration business, said Terry Bennett, director of technical research at Computer Intelligence/InfoCorp in La Jolla, Calif.

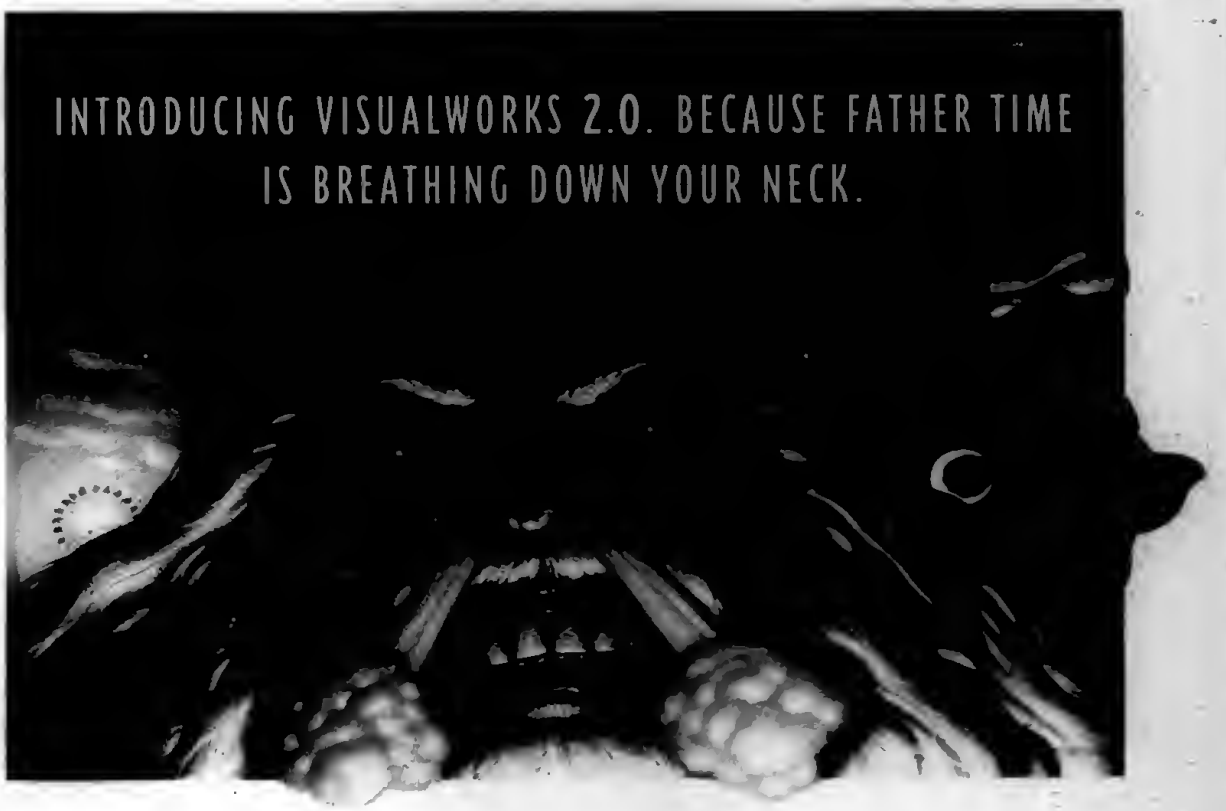
But HP cannot afford to count on an automatic migration to HP's Unix servers, users said.

"The critical sale is when companies buy their first Unix system. HP has to be available when the people are making those changes," said Doug Eltoft, president of InterWorks, Inc., an HP workstation user group.

Some HP 3000 users made it clear that their options remain open. "Right now, we're in the process of doing a systems strategy plan, so we're looking at our alternatives," said HP 3000 user Bob Lewandowski, vice president of systems at ASAP Software Express, Inc. in Buffalo Grove, Ill.

Despite the challenges ahead, industry observers remain confident that HP will still be a computer giant by the end of the decade. "There have been bumps in the road, but they've dealt with it substantially better than anyone else in the business," said John B. Jones Jr., a vice president of research at Salomon Brothers, Inc. in San Francisco. "They're either good or lucky or both."

West Coast senior correspondent Mark Halper also contributed to this story.



Whether the challenge is development, deployment or system maintenance, it seems time is never your friend. Which is precisely why we created VisualWorks® 2.0. It's the object-oriented client and server tool for professional developers who are serious about saving time.

GOOD IN THE FIRST FIVE MINUTES.

At its heart, VisualWorks 2.0 is built around the premise that simple tasks should be simple. With point-and-click ease, you'll build basic database applications without writing any SQL or Smalltalk code. Our unique ObjectLens™ feature automatically converts relational data to business objects and back again. And, applications are instantly portable to Windows (including Windows NT), Macintosh, UNIX, and OS/2.

GOOD FOR THE NEXT FIVE YEARS.

Object-oriented to its core, VisualWorks 2.0 makes even the most difficult development possible. Written in ANSI standard ParcPlace Smalltalk™, you can use its extensive class libraries to build scaleable, compiled applications that incorporate distributed application logic for both client and server development. And true object-orientation means time saved through component reuse, reduced maintenance and extensibility.

FROM THE PEOPLE WHO WROTE THE OOP BOOK.

In short, VisualWorks 2.0 reflects the best thinking by the best minds in object-oriented programming. After all, as part of Xerox's famous Palo Alto Research Center, we developed Smalltalk. And we've worked with the Information Technology experts at major corporations to develop this release.

THE "MUST HAVE" TOOL FOR CLIENT & SERVER DEVELOPMENT.

Call today for a free VisualWorks 2.0 Evaluation Kit. Ask about our superior technical support, training, consulting and on-site mentoring services. You'll find this tool, backed by the ParcPlace team, the best way to get Father Time off your back.

VisualWorks 2.0

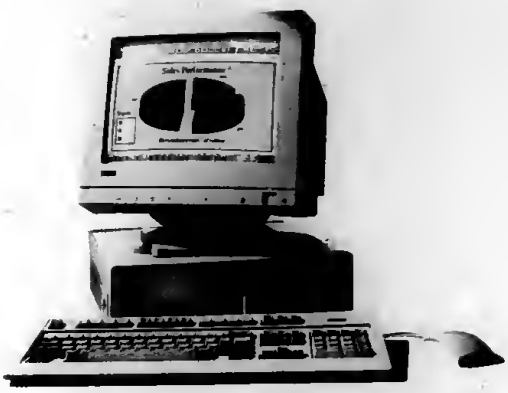
1-800-759-7272 ext. 400

All trademarks and registered trademarks are property of their respective owners. Outside the U.S. call 408-481-9090

This small appliance is easy to customize.

Introducing the Digital Celebris™, designed to be as simple and adaptable as your basic stereo. Like any small appliance, it comes with all the features you want, so it includes PCI local bus and 64-bit graphics performance. And you can choose the amount of memory and speed, up to a 90MHz Pentium™ processor. Once it's yours, it can be modified in seconds to meet your changing needs, just by popping the

intel inside



This one is too.

easy-access enclosure to switch cards or add memory. Without tools. Without disconnecting peripherals. But always with the nice, secure feeling you get from a Digital 3-year limited warranty. If you think the Celebris sounds good now, wait till you own it a while. Call 1-800-396-2180 for your nearest reseller. Please reference JDF when you call. 8:30 a.m. to 8:00 p.m. Mon-Fri. ET.

digital™ PC
Beyond the box.

© DIGITAL EQUIPMENT CORPORATION 1994. The Digital logo and Celebris are trademarks and Beyond The Box is a service mark of Digital Equipment Corporation. Pentium is a trademark of Intel Corporation and the Intel Inside logo is a registered trademark of Intel Corporation.

Briefs

Imports up

U.S. exports of electronics products reached more than $48 billion for the first half of this year, compared with imports of $55.4 billion, according to an Electronic Industries Association study. U.S. exports increased by 16%, from $41 billion for the same period last year. Imports increased 18%, from $46.8 billion for the first half of last year.

Intuit posts loss

Financial and tax software developer Intuit, Inc. in Menlo Park, Calif., posted a loss of $10.3 million for the quarter ended July 31, compared with a profit of $100,000 for the same period last year. The loss included charges of $7.2 million related to Intuit's merger with ChipSoft, Inc. Revenue increased to $31.1 million compared with $20.3 million for the same period last year.

Sage re-engineers

Sage Technologies, Inc. in Stamford, Conn., has formed a new subsidiary, Ameri-Data Consulting, Inc., which will provide business process re-engineering, systems analysis, technology management and other related services.

SHORT TAKES Intersolv, Inc. last week agreed to acquire Software Edge, Inc., giving it ownership of the Defect Control System, which allows developers to track and manage software bugs. . . . Platinum Technology, Inc. in Oakbrook Terrace, Ill., will buy Dimeric Development Corp. in Woodland Hills, Calif., a maker of Oracle Corp.'s Oracle database reorganization and administration tools. . . . Siemens Nixdorf Informationssysteme AG in Paderborn, Germany, has invested $17.25 million in Pyramid Technology Corp. in San Jose, Calif., in exchange for 2 million shares of Pyramid common stock.

Cray rolls with supercomputing changes

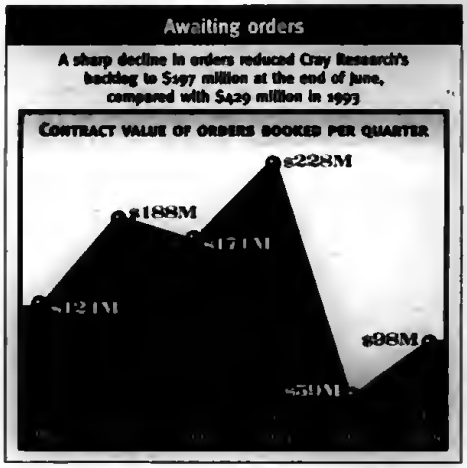
Plant revamp will aid fast turnaround

By Craig Stedman

The changes afflicting the high-performance computing market as government demand declines and technology choices proliferate are forcing even supercomputer top dog Cray Research, Inc. to learn some new tricks.

Citing a need to expand sales of smaller systems to make up for flat revenue from its biggest supercomputers, Cray recently said it plans to temporarily shut down most of its Chippewa Falls, Wis., manufacturing plant in order to retool the facility for faster turnaround times on systems.

The staggered work stoppage will begin Oct. 10 and last four to eight weeks, although it is not expected to delay any scheduled 1994 deliveries to customers, Cray said. Once a new, more automated manufacturing process is in place, 382 of the 1,530 workers at the Chippewa Falls plant will be laid off, the company added.



Changing needs

The need to produce supercomputers more quickly — and to cut the cost of making them — is driven by the rise of massively parallel processors and increased competition from Unix systems and clustered workstations. "Our customers have choices today [that] they didn't have just a few years ago," wrote John Carlson, Cray chairman and chief executive officer, in a memo to employees about the upcoming manufacturing changes.

Cray said the retooling of the Chippewa Falls plant should reduce the manufacturing cycle on its high-end C90 systems from almost a year to 16 weeks. Turnaround times on the company's smaller machines, including the soon-to-be-announced J90, will go from two months to "a month or less," the vendor said.

Despite the layoffs, analysts said Cray Research is not in the same leaky boat as other high-performance computer vendors, such as spin-off Cray Computer Corp. and Thinking Machines Corp., which have been taking on serious water. Indeed, despite flat high-end sales, first-half profits for Cray Research increased a healthy 42% over 1993, while revenue rose 19%.

However, orders fell significantly in the first half (see chart). There were extenuating circumstances because of the timing of some large orders received in late 1993 and in July, and the drop-off has not hurt revenue yet because of the long lead times on supercomputers. But analysts noted that Cray is losing the luxury of being able to take orders up to a year before delivering systems — meaning it has to build them faster to avoid revenue hits.

"Cray had been in an incredibly comfortable position, but the world doesn't work that way anymore," said Jeffry Canin, a securities analyst at Salomon Brothers, Inc. in San Francisco. Even supercomputers have "become much more of a book-and-ship type of business," he added.

Cautious optimism

Terry Bennett, director of technical systems research at Computer Intelligence/InfoCorp in La Jolla, Calif., said Cray has been slow to update its manufacturing operations. "They still handcraft a lot of their work, and they shouldn't," he said. The retooling "is a very sensible step to take."

Cray has indicated that its ability to meet 1994 financial goals "is not without risk" because of the first-half order slippage. Canin agreed that while Cray appears to be weathering the high-performance storms in relatively good shape, "you have to keep a little guarded" on its short-term outlook.

EMC turns to video server storage

By Craig Stedman

Looking for ways to continue its meteoric sales growth despite increased competition for mainframe storage, EMC Corp. has started developing storage applications for video servers using microcode that sources said was licensed from Digital Equipment Corp.

EMC also hired six engineers who had been working on the microcode at Digital, according to the sources. Both EMC and Digital declined to comment on the deal, although a Digital spokeswoman said the company is talking with other vendors interested in pieces of its video server technology.

The spokeswoman added that Digital, which is one of several companies at the forefront of video server development, is "absolutely not abandoning" that emerging market. It continues to "invest heavily" in both the server technology and future video-on-demand applications, she said.

Biding time

EMC noted that it did not get ownership or exclusive rights to the microcode. The Hopkinton, Mass., vendor would not disclose a time frame for introducing its first video storage applications and said it depends "on when the market itself is going to be a reality."

The applications would enable EMC's mainframe and AS/400 disk arrays, plus an upcoming series for Unix systems, to work alongside video servers, the company said. The combined disk and software offering would be targeted at high-performance video uses across networks or on workstations.

Multiple options

Storing video data on disk arrays would allow multiple video streams to run at the same time, making it possible for more than one user to access a particular piece of video simultaneously, said James Porter, president of Disk/Trend. The data would be split up among different disks in the array and then put into buffers to create the multiple streams, he added.

Much of the early video server development has been for pay-per-view movie uses. But James Porter, president of Disk/Trend, Inc., a market research firm in Mountain View, Calif., said he also expects corporate applications to emerge that would require array-based storage such as EMC provides. Potential examples include video-based training and storage of CD-ROM libraries so that multiple users can access data simultaneously, according to Porter.

Some early products are already available, such as an array that Micropolis Corp. has sold to hotel chains for providing in-room movie selections, Porter said. "But that's merely a junior version of what will eventually be developed" as video servers move off the drawing board, he added.

I'm hungry for more.

I'm ready to devour more information about your LattisSphere family with Advanced Analyzer capabilities. Please send me your Advanced Analyzer Information Kit including the white paper titled "RMON and Beyond: The Combined Power of SynOptics and Network General."

Name

Title

Company/Organization

Address

City/State/Zip

Telephone

FAX Number

SynOptics

MA9408A-CWLD

SYN4135 CWLD

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 150 JACKSONVILLE FL

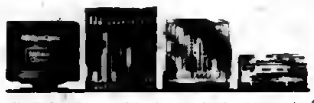
POSTAGE WILL BE PAID BY ADDRESSEE

SynOptics

SynOptics Communications, Inc.
P.O. Box 45018
Jacksonville, FL 32232-9968

You've got your intelligent hub. Your leading network management application. And your stand-alone network monitor.

Now, you can get all of them sandwiched together.



You'll find Advanced Analyzer technology across the entire LattisSphere family

It's called Advanced Analyzer™ technology and the only place you'll find it is in SynOptics® LattisSphere™ products.

Think about it. Your intelligent hub now powers two great applications: Foundation Manager™ network monitoring from Network General and Optivity™ network management from SynOptics. For the first time, these two can share information, giving you unprecedented visibility, faster troubleshooting and optimized network design.

On the hardware side, you get another killer combination: a probe-in-a-hub. One that not only supports full RMON, but SuperRMON™ capabilities as well. Meaning it goes as deep as Layer 3 addresses and protocol distribution on a per-port basis. So you'll automatically see the problem, plus the physical location and network address. Pretty sweet, huh?

1-800-PRO-NTWK
EXTENSION 300

But what else would you expect from the combined strengths of Network General, the maker of the Sniffer® Network Analyzer, and SynOptics, the worldwide leader in intelligent hubs?

So give us a call at 1-800-PRO-NTWK, ext. 300 for an information kit on our Advanced Analyzer technology. Trust us, you'll eat it up.

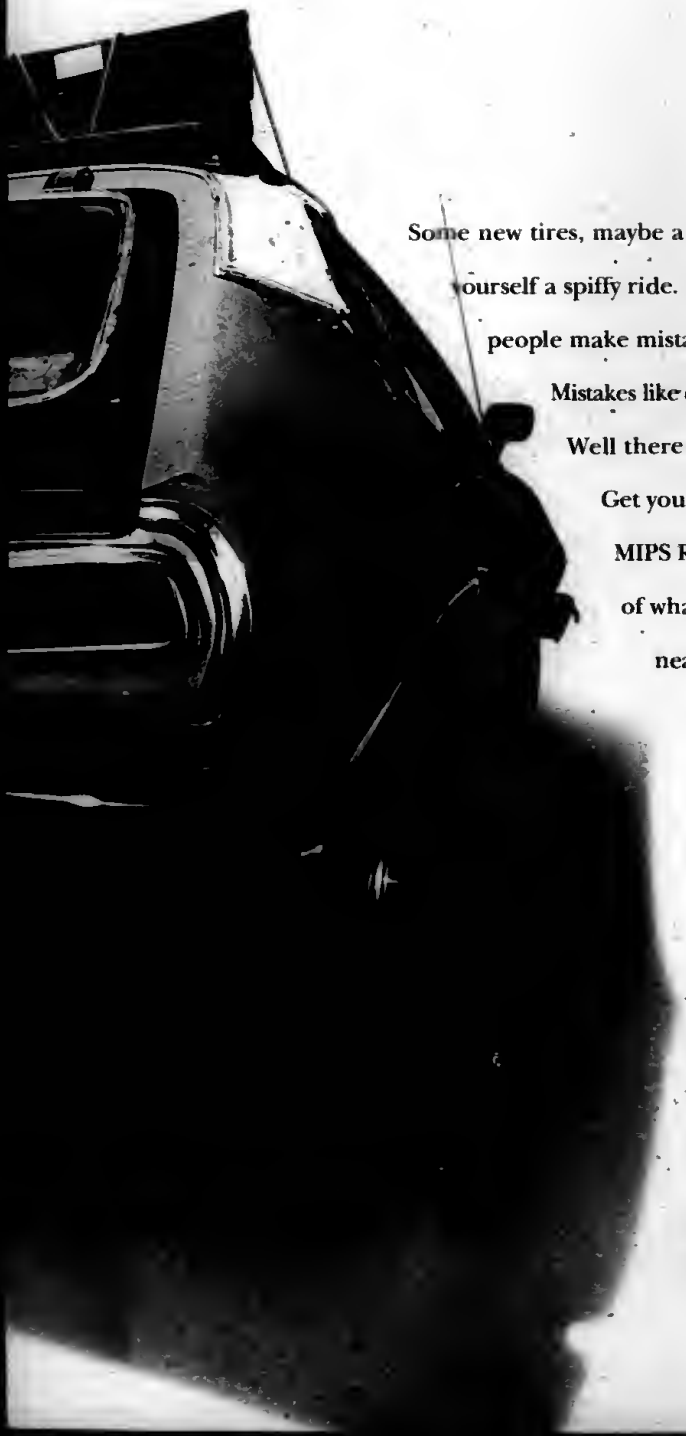
SynOptics

Building the Network Fabric

Imagine a SynOptics hub with the good stuff of Network General.

You were a legend. But you just had to choose a system with Pentium™ instead of NEC's VpSeries.™ You run Windows NT.™ What on earth were you thinking? Now look at you. No more swanky condo. Booted from the club. Your suits haven't been dry-cleaned in six months. Come on now, it's not so bad. It's not like your mom has to drive you everywhere.

See us at Windows World-Dallas, Booth #L425



Some new tires, maybe a fuzzy steering wheel cover, and you've got yourself a spiffy ride. Hey, no one said life is fair. Perfectly decent people make mistakes that unravel their perfectly decent lives. Mistakes like choosing a Pentium or PowerPC™ system to run Windows NT. Well there is a way to avoid the heartache of vinyl bucket seats. Get your hands on as much information about NEC's V_R-Series MIPS RISC microprocessors as quickly as possible. Here's some of what you'll learn: NEC's 200 MHz V_R4400™ runs Windows NT nearly three times as fast as the 90 MHz Pentium processor. (And we'd just love to tell you how the V_R4400 stacks up against PowerPC, only PowerPC doesn't run Windows NT yet.) Look, we've got plenty more to say. So call NEC Electronics Inc. at 1-800-366-9782 and ask for Info Pack #182. Pretty soon, you'll be haggling with those snazzy dressers at the new car dealership.

MICROSOFT® WINDOWS NT™ COMPATIBLE

NEC

MIPS RISC

© 1994 NEC Electronics Inc. Microsoft and the Windows logo are registered trademarks and Windows NT is a trademark of Microsoft Corporation. Pentium is a trademark of Intel Corporation. All other registered marks and trademarks are property of their respective holders.

Back to basics

The computer industry is on track to enjoy another record year.

Yet the U.S. Department of Commerce reported 10 days ago that service sector productivity actually fell at a 2.5% annual rate in the most recent quarter. That's nothing new: Nonmanufacturing productivity has been bumping along at the same level for more than 10 years while computer sales have skyrocketed.

For all the bucks corporate America is dropping on bits and bytes, there is still little hard evidence that the investment is paying off in productivity among so-called information workers. Sure, you can't very well do business today without computers, but that's hardly an argument for aggressive investment in the leading-edge stuff.

With this issue you'll find our seventh annual *Premier 100* magazine, a roundup of the public companies that deploy information systems most effectively. This year's *Premier 100* is a marked departure from our previous six efforts. Those rankings rewarded companies that, in our opinion, spent IS dollars most intelligently. Our revised methodology simply recognizes those who spend the least and have the biggest profits to show for it.

It's a simple model, but business these days is going back to simpler values: Deliver quality at a fair price, and do more while spending less. It's not rocket science, and our *Premier 100* IS executives will tell you that their job — delivering value to their end-user customers — is no different from the mission of any successful business.

Here's a profile of our average *Premier 100* IS executive: He (almost all of them are "he"s) believes that everyone who needs a PC should have one. He has one IS staff member for every 20 employees. His budget increased a healthy 8.4% this year. He reports one level below the chief executive officer. He has more than 20 years of IS experience but less than 10 years of formal IS training.

He's moving more and more spending authority out to user departments. He likes to do things himself. He doesn't trust outsourcing and doesn't spend much on outside services. He's enthusiastic about client/server, but he's not about to bet his job on the first client/server project. He spends less than half his software budget on maintenance. He is religious about return on investment. No new project gets started unless someone on the business side sponsors it. He doesn't particularly like to talk about his accomplishments because he considers what he does to be too strategic to the business.

Surprising? Not really. Productivity in IS is really no different from productivity in any other business. You block and tackle, watch your rear and justify everything in terms of business benefits. Our *Premier 100* IS departments are those who execute the fundamentals well. Congratulations to them.

Paul Gillin, *Editor*
Internet: *pgillin@cw.com*

Client/server reaps significant reward

Regarding the editorial "Client/server Q&A" [CW, Aug. 29]: Such cynicism! Our task is to *boldly* forge ahead into new and promising technologies. Are better corporate communications and uniformity of data "intangible" benefits? Costs will *never* decrease (without layoffs). As for your reply on LANs, credibility need not be an issue with the proper skills, procedures and equipment.

Certainly, the pathfinder client/server project in an organization should not be a mission-critical one. But already there are major industries using client/server in this fashion.

Perhaps if you had backed up your column with a few horror stories . . .

Len Thornton
Systems manager
President's Choice International
Buffalo, N.Y.

Weighing benefits

"No doubt about IT" [CW, Aug. 15] was a good review of our attempts at determining whether information technology adds value to the enterprise. To say that we continue to struggle with the same old tools spawned by our traditional links with the financial community is an understatement. I believe we need to continually force ourselves to look toward the corporate view.

One enterprise attempted to deal with information technology from a return-on-investment perspective. Another tried to look at portfolios, but because each portfolio was a bundle of applications necessary to keep a function running, who decides whether that function needs to exist at all?

The final company relied on a cost/benefit approach, but one that "provided us with a lot more detail than our previous way of doing a capital expenditure analysis." This suggests that the more detail, the more right the answer will be.

Also, a part of the information technology proposal sped up collections of overdue accounts. Is the enterprise creating its own problem by selling to those it knows will be late with payment?

We need to understand why this account is overdue and have the information in place to fix it. Perhaps a significant information technology case is not a "stovepipe" capital investment decision but rather one that presents the cost of achieving revenue with the current technology compared with the changes caused by a proposed new technology package. That is a step in the right direction.

Dave Kennedy
Beavercreek, Ohio

Welcome news about MS-DOS

"Few mourn DOS decline" [CW, Aug. 22] is good news, as Microsoft has only been playing catch-up ever since the advent of [Digital Research, Inc.'s] DR-DOS 5.0, now Novell DOS 7.0. Unfortunately, I don't believe Microsoft is serious. This is just another ploy to intimidate people to switch to Windows 95.

As for all that new 32-bit technology, I have a good working version called OS/2, which runs Windows and allows me to continue to use my Novell DOS 7.0. I didn't have to give up DOS or run somebody else's version just to use 32 bits.

Thomas J. Brown
New York

Users *are* IS

Bravo to Kate Colborn in "Grace under fire" [CW, Aug. 15] for her tactful mention of an IS taboo: the pervasive lack of people skills.

The fact is, with many of the technology battles behind us, IS in the '90s needs to focus more on customer service than new technology. IS management and staff must learn to respond to users' cries for help with greater sensitivity. Like it or not, users *are* the job of IS, not just some annoying distraction from it.

Matthew Conescu
Atlanta

BEST COMPUTER NEWSPAPER 1992, 1993
COMPUTER PRESS ASSOCIATION

■ Computerworld welcomes comments from its readers. Letters may be edited and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

yes

UnixWare®

yes
UnixWare®

COMPUTERWORLD

Editor in Chief
Bill Laberis
Editor
Paul Gillin
News Editor
Maryfran Johnson
Sections Editor
James Connolly
Assistant News Editor
Patricia Keefe
Assistant Sections Editor
Johanna Ambrosio
Technical Editor
Charles Babcock
Senior Editors
Elisabeth Horwitt, Networking
Craig Stedman, Large Systems
Ed Scannell, PC Software
Michael Fitzgerald, Mobile Computing
Rosemary Cafasso, Client/Server Software
William Brandel, PC Software
Senior Writers
Melinda-Carol Ballou
Lynda Radosevich
Mary Brandel
Staff Writers
Stephen P. Kiell Jr., Jaikumar Vijayan
New Products Writer
Tim Ouellette
Research Coordinator
Stefanie McCann
Features Department
Senior Editors
Joseph Maglitta, Corporate Strategies
Lory Zoffnik Dia, In Depth
Jennifer deJong, In Depth
Allan E. Alter, Management
Michael L. Sullivan Trainor, CW Guide
Associate Editors
Jodie Naze, Careers and Marketplace
David B. Weldon, Management
Cathleen Duffy, CW Guide
Senior Researcher
Kevin Burden, Firing Line/Scorecard
Assistant Researcher
Erin Callaway, Resource Center
Fluegelman Intern
Renee Barber
Chief Copy Editor
Anne McCrory
Assistant Chief Copy Editor
Christina Aicardi Maguire
Senior Copy Editors
Kimberlee A. Smith, Jill Zolot
Ellen Fanning
Copy Editors
Michelle I. Keyo, Jay F. Rizzi
Kimberly Gilliard, Michelle Grabon
Design Director
Tom Monahan
Senior Graphic Designer
Nancy Kowal
Design Assistant
Janell Genovese
Graphic Designers
Stephanie Faucher, Mary Beth Welch
Graphics Specialist
Jose E. Bruzual
Cartoonist
Rich Tennant
Office Manager
Linda Gorgone
Editorial Assistants
Lorraine Witzell, Connie Brown
Aleksandra Skulte
Rights and Permissions Manager
Sharon Bryant
Electronic Marketplace Liaison
Lisa Davidson
Computerworld Client/Server Journal
Alan Alper, Editor
Managing Editor of Special Projects
Catherine McCrory
News Bureaus
Mid-Atlantic
Thomas Hoffman, Senior Editor
(201) 967-1350
Julia King, Senior Editor
(215) 532-7599
Washington, D.C.
Mitch Betts, Senior Editor
(202) 347-6718
Gary H. Anthes, Senior Editor
(202) 347-6934
West Coast
(415) 347-0555
Jean S. Bozman
Senior Editor, Open Systems
Steve Moore
Senior Editor, Networking
Kim S. Nash, Senior Editor, Databases
Mark Hall, Senior Writer
Suruchi Mohan, Senior Writer
Chris Flanagan, Editorial Assistant
Midwest
Ellis Booker, Senior Editor
(708) 827-4433
Pacific Northwest
Stuart J. Johnston, Senior Editor
(206) 641-7720
Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
(508) 879-0700
TDD: (800) 428-8244
CompuServe: 76537,2413
Subscriptions: (800) 669-1002

Technology disconnect — real world danger

Charles B. Wang

Necessity may be the mother of invention, but frustration is often the father of change.

In the past two years I have met with hundreds of corporate leaders from around the world, and I can report that we must be on the edge of a great era of change because when it comes to information technology, the frustration level of CEOs is stratospheric.

The consensus is startling:

- While information technology is often the largest single investment a company makes, few CEOs are able to quantify the results. Unlike other investments, the yield from information technology seems to defy measure. Increasingly, it seems to defy justification.
- Because many CEOs, if not most, are resigned to techno-illiteracy, they depend on resident technologists — usually at the CIO level — for critical decisions that may make or break the company. Unfortunately, as much as CEOs are unfamiliar with the technology, their CIOs are unfamiliar with the core business that technology is intended to support.

It is this "technology disconnect" that has caused such a strain between the business and technology sides of corporate life that it threatens the profitability of every company where it has taken hold. It is difficult to imagine any other result when we realize that the turnover of CIOs is among the highest for any executives.

DAVID FLAHERTY

With some CIOs lasting only two or three years, many information technology projects never come to fruition during their initiator's tenure. The replacement CIO is thus tempted to declare a problem (which makes sense because newer technology has now become available) and make major changes. These may or may not be fully implemented before the revolving door brings forth yet another CIO.

The effect can be disastrous. Once a company's information technology strategy becomes fragmented and ceases to function smoothly, managers may begin the finger-pointing and assigning of guilt that replaces the taking of responsibility. Meanwhile, employees find themselves untrained in the new system or cannot seem to get the new system working with what's left of the old. Nothing works.

When the frustration level reaches epidemic proportions, the CEO's reaction is often resolute determination to change the system once and for all. At this point a new CIO is chosen and typically ordered to clean up the mess by starting over. With the predictability of church bells on Sunday morning, the promise of new technology is heard in the corporation.

Faced with what amounts to technology-of-the-month, the CEO is likely to depend on his CIO as he wouldn't depend, for instance, on his chief financial officer. In fact, the normative response is to call in the resident guru, sign the check and hold one's breath.

The result of this revolving-door technology is that some CEOs have simply lost faith in the promise of computing. Yes, they'll say, information technology automates accounting and payroll and record keeping, but it has no potential for changing the way we do business.

Yet many of these same CEOs are aware that some firms have indeed remade themselves through information technology. Information technology has provided not only faster word processing and number-crunching but new ways of doing business and, not infrequently, entirely new and fruitful profit centers.

This troubling paradox — why them, not us? — need not remain a mystery forever. Companies that use information technology successfully are led by CEOs who have come to terms with it. They have not become technology experts but have absorbed enough of the basic terminology and concepts to at least rudimentally discuss the options with their CIOs.

Successful CEOs also refuse to look at information technology as a corporate black hole that sucks in money but whose effect can never be seen. Such CEOs are not afraid to ask simple questions: What does it do? How is that better than what we have now? Just what is the ultimate cost? Does this include retraining — typically several times the cost of the installation itself — or will training costs be tucked conveniently into someone else's budget?

How dependable is this system: 99%? What happens when the fateful 1% has its day? Is this new technology compatible with our old technology investment? What are the advantages of keeping our legacy system and upgrading it? What will we get for every dollar we invest? In other words, how will this help us be a more profitable bank, shoe manufacturer, airline, advertising agency or retailer?

By necessity, this means treating the CIO as a member of the business team and not a hired gun, a development that has positive consequences of its own: The CIO might well find that he or she is suddenly happy to be part of a corporation that values his or her contribution to income, not just to costs.

But the CIO has a responsibility, too, and that is to establish a career in business — not merely in technology — by fully joining the corporate team, even if it means putting aside the idea that new is best and revolutionary technology is ipso facto superior.

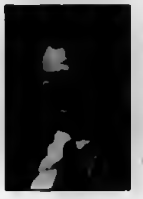
Having said earlier that frustration is the father of change, I should make it clear that when frustration brings about the wrong changes, the result is only more frustration. When frustration results in meaningful change, it is to be applauded — and so too will the CEOs and CIOs who bring it about.

Wang is chairman and CEO of Computer Associates International, Inc. and author of *Techno Vision, The Executive's Survival Guide to Understanding and Managing Information Technology*, to be published by McGraw-Hill Sept. 26.

Enterprise networking market: Chaos or clarity?

Gary Law

Many of the recent mergers in the networking industry have been driven by the same forces that brought together AT&T and McCaw Cellular Communications or spawned Bell Atlantic's attempt to merge with Tele-Communications. There has been a massive repositioning in the market caused by the advance of technology that speeds voice, video, data and images simultaneously over the same network.



The imminent marriage of SynOptics and Wellfleet clearly reflects this trend. However, it also represents the reality that critical mass, a comprehensive product portfolio based on emerging, high-speed technology and a standards-based architecture, will be necessary to meet customer requirements for faster, more flexible and easier to manage internetworks.

In the past 18 months, the networking industry has seen nearly a dozen sig-

Networking market, *page 41*

H E W L E T T - P A C K A

HP Vectra VL2 PCs
HP quality in value-priced PCs, from
$1,099

HP Vectra N2 PCs
High-performance network-ready PCs in a slimline package, from
$1,309

HP Vectra M2 PCs
High-performance PCs for the connected office, from
$1,679

HP Vectra XM2 PCs
Exceptional 486 performance for advanced business use, from
$2,239

HP Vectra XU PCs
The ultimate PCs for advanced business and technical applications, from
$3,749

HP Vectra Interactive PCs
Integrated multimedia and communications solutions for business, from
$1,600

HP offers a full 3-year warranty on all PCs, including 1-year on-site and 2-year carry-in.*
For more information, call **1-800-322-HPPC, Ext. 8781.**

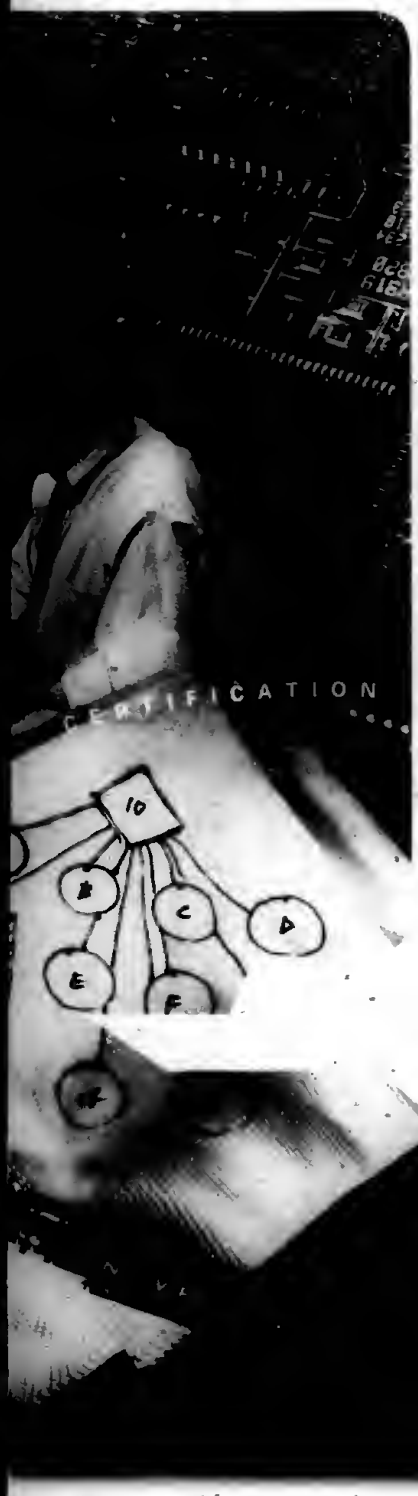
intel inside

MICROSOFT WINDOWS READY-TO-RUN

yes It runs with NetWare

All prices include hard disk drive (VL2-, N2-, M2-, Interactive PCs-, XM2-210MB IDE, XU-270MB SCSI-2). Prices do not include monitors. Microsoft and the Windows logo are registered trademarks and Windows is a trademark of Microsoft Corporation. Pentium and the Intel Inside logo are U.S.

R D P C s



You're looking at partnership in a whole new light.

If you have PCs on a network, hardware and software compatibility is undoubtedly one of your biggest concerns. You need to know who's talking to whom.

And you can start by talking to Hewlett-Packard. Together with partners like Intel, Microsoft,* Novell and others, we're developing technology that ensures true compatibility, across the board and across the network. So your PC runs everything it's supposed to, wherever it's supposed to. Because if it doesn't work in your environment, it doesn't work at all.

HEWLETT® PACKARD

trademarks of Intel Corporation. *For a nominal fee a 1-year on-site service contract can be upgraded to 3-year on-site service. ©1994 Hewlett-Packard Company PPG410.

EXTREME PROBLEMS DEMAND EXTREME SOLUTIONS.

KILLER SOLUTIONS FOR CLIENT/SERVER WORKFLOW FINANCIALS.

Although there are promising silver bullet solutions to even the most extreme financial management problems, believing that they go far enough in technology and functionality will leave you with lots of sleepless nights.

SOFTWARE WITH A VISION: INFORMATION VS. DATA

Like many Fortune 1000 customers of our 2nd generation client/server workflow financials, you have a strong vision for your business, your department, your job. You think today's applications should match all elements of your job, and deal with all forms of information. This should include data that's structured and unstructured, high-value and low value, stored or in-transit, inside applications or on the desktop.

It should also handle data in electronic, microfiche or source image form. You believe that these applications should do more than mere transaction processing and perform the business process tasks you perform. Like the 'walking' from desk to desk, the 'opening' of file cabinets, the 'reaching' into microfiche or printed report records. You know that this is the only way to get true competitive advantage based on total information management.

ADVANCED ARCHITECTURE FOR AN ADVANCED VISION

Only Computron delivers such 2nd generation client/server workflow financials, marrying advanced client/server technology and distributed objects with proven high-power functionality for every UNIX and legacy server, client and database (Oracle, Sybase, etc.). A recent survey by IDC lists Computron as one of the top five client/server accounting software companies in worldwide revenues. And we are the first to deliver high-impact technologies like workflow/image and COLD, while others are still talking about strategy.

So call about our "Killer" solutions or for our free white paper, "Financial Software... Client/Server and Beyond".

computron 800-828-7660

FINANCIAL, WORKFLOW/IMAGE AND COLD SOLUTIONS

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown: ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate: $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295. all other countries $295. Foreign orders must be prepaid in U.S. dollars

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government: State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
95. Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm. LAN Mgr. /PC Mgr., Tech Planning, Admin Svs
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11. President, Owner/Partner, General Mgr
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems

(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

Recyclable Paper

COMPUTERWORLD

E4438-8

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown: ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate: $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295. all other countries $295. Foreign orders must be prepaid in U.S. dollars

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government: State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
95. Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm. LAN Mgr. /PC Mgr., Tech Planning, Admin Svs.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11. President, Owner/Partner, General Mgr
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems

(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

Recyclable Paper

COMPUTERWORLD

E4438-8

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

Networking market: Chaos or clarity?

CONTINUED FROM PAGE 37

nificant mergers or acquisitions, all driven by the need to meld critical network switching and routing technology into integrated solutions that will take customers into the 21st century and the world of switched internetworks.

This has driven to the altar companies such as Cisco and Crescendo, Bytex and Network Systems, Chipcom and David Systems, and 3Com and Synernetics.

To the untrained eye, all this activity appears to be nothing more than unleashed chaos. A closer look, however, reveals there is some method to this madness. New user requirements and the convergence of technology are shaping the market's future.

This year the internetworking market, combining both the hub and router industries, will exceed $4 billion, marking the fact that client/server technology has come out of the closet. In addition, manufacturing revenue from companies that make LAN products is expected to exceed $13 billion this year.

Internetworking has become a strategic part of mainstream business operations and requires strategic networking partners with the resources, technology and expertise to build and support a company's global network.

Networking customers basically want the following:

- Better network systems capable of solving real business problems and supporting more robust applications such as groupware.
- A migration path to new high-speed technologies, such as Asynchronous Transfer Mode (ATM) and switched Ethernet networks.
- Investment protection for shared-media networks and older protocols such as Ethernet, SNA and DECnet.
- The ability to lower the overall cost of network ownership.

Users want all this at lower costs, with better performance and without being tied to a proprietary vendor architecture.

The answer to these issues lies in the advance and convergence of new high-speed networking technology — namely ATM, LAN or Data Link Switching — and high-speed virtual network routing (the ability to route data between logical LANs using a single router interface). Each of these technologies can solve a particular problem, but no one really addresses them all. To do that requires bringing together several technologies — where the sum is clearly greater than its parts.

For vendors to meet customers' future requirements for internetworks, these technologies must be implemented in the context of a single, manageable system that can be delivered at a lower cost to users. It is imperative that vendors have specific expertise in each of these areas, and as vendors quickly realize this, they scramble to get all the pieces in house.

Mergers will typically accelerate this process, providing the successful introduction of next-generation switched internetworks that meld these new technologies.

In fact, the single biggest benefit customers will derive from the SynOptics/Wellfleet merger will be a new networking system that combines the best-of-breed routing, switching and bubbing into a single, standards-based system.

Once the customer's needs are understood, the reasons for the consolidation in the networking business become clear.

Law is director of market development at SynOptics Communications, Inc. in Santa Clara, Calif.

IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*.

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PC's, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

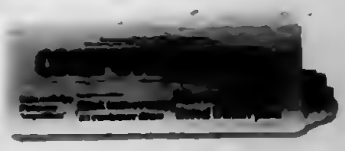
That's why over 139,000 IS professionals pay to subscribe to *Computerworld* every week. Shouldn't you.

IT'S WHAT YOU READ.

Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, *The Premier 100*, an annual profile of the leading companies using information systems technology.

Call us toll-free at **1-800-343-6474**. Or use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld*.

Then you can spend less time reading about the world of information systems. And more time conquering it.



The Newspaper of IS

PREVAILING ATTITUDE.

"Despite all the hype, it seems like you hardly ever get more than a couple of hours out of a notebook battery."

FOCUS GROUP, LOS ANGELES, 1994

LATITUDE™ PREVAILING.

"Dell's new batteries and sleep strategies rendered our standard instantly obsolete."

MARC ABRAMS, VERITEST, INC
INDEPENDENT TEST LABORATORY

"It's the only notebook I've ever used that made it from coast to coast and back."

JOHN DUNKLE
WORKGROUP TECHNOLOGIES

DELL LATITUDE XP INTELDX4 75MHz SYSTEM

$3399

BUSINESS LEASE[◊] $126/MO

- 9.5" DUAL SCAN STN COLOR
- 8MB RAM (36MB MAX RAM)
- 340MB HARD DRIVE
- NEW SMART LITHIUM ION BATTERY
- 3-YEAR LIMITED WARRANTY[δ]
- 30-DAY MONEY BACK GUARANTEE†

ORDER CODE #600011

TO ORDER, CALL

800-937-1420

(CENTRAL TIME) MON - FRI 7AM - 9PM, SAT 10AM - 6PM SUN 12PM - 5PM

KEYCODE #11HN7

intel inside

†For information on and a copy of Dell's 30-day Total Satisfaction Guarantee, Limited Warranty and the third-party service contract, please write to Dell USA L.P. 9505 Arboretum Blvd. Austin, TX 78759-7299, Attn: Warranty. Guarantees available in USA only for registered-users of Dell Performance Series systems purchased after 7/1/92. For a complete copy, please call our TechFax℠ line at 1-800-950-1329 or write to the address above. [δ]The 3-year Limited Warranty consists of Dell's standard return-to-depot warranty plus a 2-year parts only contract for years 2 and 3. Also included with these systems is 1-year next-business-day on-site service provided by BancTec Service Corporation. On-site service may not be available in certain remote areas. Prices and specifications subject to change without notice. [◊]Business leasing arranged by Leasing Group, Inc. The Intel Inside logo is a registered trademark and IntelDX4 is a trademark of Intel Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation. All rights reserved.

Scheduling software

Beta users applaud Lotus' Organizer improvements

By Lynda Radosevich

Lotus Development Corp. has significantly improved its Organizer scheduling software by filling in dozens of end-user functionality gaps, according to a handful of users testing Version 2.0, which is under development.

In addition, Lotus has added some Notes support and enhanced CC:Mail support in Organizer 2.0, according to company officials.

Lotus announced the new version last week at Networld/Interop '94 in Atlanta and plans to deliver it in the fourth quarter. Users said the improved version includes the following:

- Better printing support, which lets users print out their appointments in popular formats like Day-Timers, Inc.'s day-planning books.
- The call management application linked with the address book and other modules.
- The ability to look at a whole month of schedules.
- More robust customization capabilities, which let users create different kinds of appointment categories.

About time

Organizer 2.0, which costs $149 per user, is the first major upgrade to the personal information management software in two years.

Print capabilities

"In 1.x, Organizer looked good on-screen, but it didn't print out as well as other programs," said John Taylor, manager of information systems at Savings & Community Bankers of America, a savings industry trade association in Washington. "The new version plugs that gap. I'm only in front of my PC for two hours a day, so I rely on the printed output."

Lotus did not change Organizer's notebook-style look, which is popular with users.

"The good news is they didn't mess up the interface," said Keot Soule, president of Soule-Microsystems, a consulting company in San Francisco.

Organizer 2.0 also allows users to grant other users varying levels of access to the same Organizer file. For example, an assistant can schedule appointments for an executive while the executive is editing the same file, according to the company.

One directory does all

On the workgroup side, Organizer can retrieve individual names from the Notes address book, eliminating the need to maintain a separate directory.

Lotus introduced a similar capability for CC:Mail last March. Users can schedule group meetings using Notes and CC:Mail as the transport for the meeting request messages. Also, mobile users can automatically merge their Organizer file with a network version.

However, while users contacted were happy with Organizer 2.0 as a personal tool, it still leaves room for improvement in group scheduling, according to Karl Wong, an analyst at Dataquest, Inc. in San Jose, Calif.

What is missing — as in the case of most electronic-mail-dependent group schedulers — is the robust wide-area network support and real-time scheduling that users of host-based messaging and scheduling systems have, Wong added.

"I don't think that any of the LAN-based systems can do what you can do on single-box systems," Wong said, adding that the store-and-forward nature of E-mail can create delays in propagating scheduling information.

D&B unbundles platform duties

By Rosemary Cafasso

■ Dun & Bradstreet Software plans to soon unbundle some desktop functions from its SmartStream client/server platform and offer them to customers for less than a full-blown SmartStream end-user license would cost, according to users briefed by the company.

Doug Gosling, manager of financial systems at Ontario Hydro, last week said he had been told by D&B Software that components such as the SmartStream Analyzer, which allows users to dynamically view and manipulate data, would be available as a separately licensed product.

"It allows you to get some [SmartStream] capabilities into the hands of people without spending a fortune on the platform," Gosling said.

While customers negotiate individual client/server deals with D&B Software, additional SmartStream seats, or end-user licenses, can cost about $2,000, customers said last week. The users said D&B Software indicated that a separate license for SmartStream Analyzer would cost about one quarter of that amount.

Company officials last week declined to comment on unbundling plans. However, officials had previously confirmed more general plans to announce changes to its pricing structure. That action could come within several weeks.

The upshot to unbundling is that users could expand their SmartStream installations for much less money and give additional users only the functions they would actually use.

Bob Culmer, director of information technology at Phillips Cables Ltd. in Toronto, said he had also discussed plans with D&B Software to unbundle the Analyzer component. Phillips Cables is moving to FinancialStream 2.0, a set of financial applications D&B Software announced last month.

"I thought it was silly to pay so much money when you have a lot of execs who want to view and analyze, [but] they don't need to be SmartStream users," Culmer said. The unbundling "would be a cost-effective way for me to roll out the decision-support capabilities to the company without incurring the costs of [adding] a mainstream general ledger user."

Observers called the plan a smart move for D&B Software because it is getting kicked around by rivals and should do more to leverage its strengths. Analysts said SmartStream's end-user functions as well as its workflow and ad hoc capabilities are ahead of such rivals as Oracle Corp. and SAP America, Inc.

IBM offers 'Warp' speed access to the Internet

By Ed Scannell

Trying once again to outflank Microsoft Corp. in the operating systems war, IBM has released beta versions of tools that give OS/2 users bundled-in access to the Internet.

When IBM ships Warp, the 4M-byte version of OS/2, next month, it will offer users an "on-ramp" to the information highway by providing several utilities in a BonusPak of OS/2 applications.

These utilities will include Gopher, which permits access to a range of information servers to view graphics and text; Telnet, which gives users access to remote data libraries such as the Library of Congress; and a comprehensive electronic-mail package.

Microsoft officials have promised that similar capabilities will be built into its next version of Windows, now called Windows 95, which is expected in the first half of next year.

Supply for demand

Besides trying to beat Microsoft to the punch, IBM decided to bundle the utilities with Warp in part because of an outside researcher who received thousands of questions from users asking how they could access the Internet.

"We received about 15,000 questions from business executives in the first quarter of this year, and the No. 1 topic is the Internet," said Andrew Garvin, president of Find/SVP, a New York-based researcher.

Some users appear more interested in IBM's Internet connection than in some of the other applications in the Warp BonusPak, which includes a suite of productivity applications and various desktop utilities.

"We don't have any burning needs for this now, but I can see where in the future it will be pretty valuable. There is a lot of stuff on-line in the transportation business that can't easily be accessed unless you have a set of integrated tools like this," said Todd Pool, a programmer at Gemini Transportation, Inc. in Houston.

Some others, mostly larger accounts, said the new utilities are redundant and could even cause technical conflicts with what they have.

"It is not really the kind of built-in convenience we need. It tends to cause problems with the networking things we already have in place," said Virgil Pittman, information systems manager at The Fireman's Fund, Inc. in San Francisco.

With these utilities, Warp users will have one-button access to the IBM Global

Warp, page 46

Standard to aid telephony integration

By Ellis Booker

Even as user enthusiasm for integrated applications grows, the two most used desktop devices — the computer and the telephone — continue to work in annoying isolation.

That is changing, however, thanks to several standards efforts for linking these two ubiquitous systems on the desktop.

On one hand, there are application programming interfaces (API) to control telephony resources on the desktop. This is the focus of several efforts, notably Intel Corp./Microsoft Corp. Telephony API (TAPI), Apple Computer, Inc.'s Macintosh Telephone Manager and AT&T Corp./Novell, Inc.'s Telephony Services API for connecting LANs with digital switching systems.

On the other hand, an even more promising but less publicized standard for server-based solutions is gaining momentum.

Received backing

The Signal Computing System Architecture (SCSA) has garnered support from more than 230 top computer and telephony hardware and software providers. Unlike the client-centric APIs, the SCSA seeks to provide interoperability of server applications across a wide range of media types.

SCSA was spearheaded last March by Dialogic Corp. in Parsippany, N.J., a leading maker of voice-processing interfaces. SCSA is a distributed API split between a hardware specification and a software API. The hardware level ensures interoperability among signal computing hardware from multiple vendors; the SCSA Device API is an interface to call control and media processing applications.

"This supports all media, whereas the others support just call control. ... It's the only thing out there that ties everything together," said Jim Burton, president of C-T Link, Inc., a Boston-based consultancy specializing in computer/telephony integration.

Burton said he expects SCSA-compliant products to ship in the first part of next year, with mainstream applications appearing in the spring.

In fact, SCSA-based hardware announcements have already begun. Last month, for instance, Hewlett-Packard Co. announced plans for SCSA support using Dialogic equipment on its Intelligent Peripheral, a hardware platform for telephone companies due out by year's end.

Software-compliant SCSA applications are due to show up after the draft specification of the SCSA Telephony Application Object Framework is published later this month.

"We'll see many more mid-size companies taking advantage of these [voice-processing] technologies and, from our point of view, taking advantage of speech recognition," said Jeff Hill, vice president of product development at Voice Processing Corp. in Cambridge, Mass.

However, even though Hill sees the SCSA and TAPI as targeting quite different markets — one for high-end, multiple-server, multiple-line installations and the other for individual desktops — he would like to see the two standards relate to each other. "It would help if these things were close to the same because it would make it easy for developers," he said.

Meanwhile, Burton is spying an intriguing application for SCSA-based servers: private branch exchange replacements.

"I think we'll see companies using SCSA architecture for integrated solutions that include providing the telephony function," he said, noting that the SCSA hardware standard includes a switching matrix that could "give you a pretty good-size telephone system."

Trio of buses

The software component of SCSA includes service provider interfaces to three hardware bus standards: the SCSA hardware model, the Multi Vendor Integration Protocol from Natural Microsystems ID and proprietary hardware bus platforms.

Happy campers

While it is mostly developers who are cheering the arrival of telephony APIs, end users are happy, too, about easier-to-use development tools for creating telephony applications.

One of the latest of these development tools is the Visual Voice tool kit from Stylus Innovations, Inc. in Cambridge, Mass. Visual Voice, an interface for Microsoft's popular Visual Basic, provides a graphical development platform for Windows-based telephony applications.

Pennsylvania State Credit Union in Harrisburg, Pa., is using Visual Basic and Visual Voice to develop a system to track shareholder votes for its board of directors elections. "Our annual election involves a mailing to 200,000 members at a cost of $100,000-plus," said credit union President Gregory Smith. Smith said he expects the voice response application, which is being developed in-house for use early next year, to save $60,000.

At the high end, Visual Voice supports Dialogic Corp. interface cards. Last month, Stylus announced support for sound boards that use IBM's Mwave digital signal processor technology.

Visual Voice for Mwave sells for $495 or can be purchased with an Mwave-based sound board for $695. The software requires a 486SX or higher chip and Windows 3.0 or above.

—Ellis Booker

Briefs

Stac for Windows

Stac Electronics said it will ship a version of its Stacker data compression utility for Windows 95 within 90 days after the operating system ships next year. Windows 95 is the new name Microsoft Corp. has given to its next major release of desktop Windows, which was previously code-named Chicago.

Multimedia update

Microsoft said it is shipping an update to its multimedia word processing package that combines Word 6.0 for Windows and the multimedia version of Microsoft Bookshelf '94. The package, which comes on a CD-ROM, costs $399, with upgrades from current versions of Word and Bookshelf costing $149. Upgrades from competitors' word processors also cost $149.

Microsoft extends its support hours

By Stuart J. Johnston

As part of its move to expand into the world of enterprise computing and server technologies, Microsoft Corp. has been quietly reorganizing its technical support group to provide the kind of support that traditional information technology organizations have come to expect.

Microsoft Premier support subscribers can now get technical support 24 hours a day, seven days a week — an option that Microsoft recently added for its Solution Partner resellers, worldwide authorized support centers and corporate accounts.

"Our problems don't exist between 8 [a.m.] and 4 [p.m.]" because information technology specialists typically have to do software maintenance, upgrades and new installations after office hours, said Briscoe Stephens, coordinator for space sciences at NASA's Advanced Scientific Information Systems Group in Huntsville, Ala.

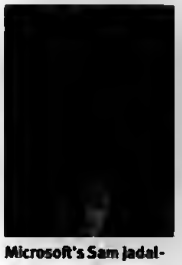
For Stephens to pay five employees to be authorized to call Microsoft anytime is equivalent, when all costs are considered, to paying each for an extra five minutes a day — a total of about $25,000 a year.

"That's a lot cheaper than $450,000 per year [for some types of mainframe support]; it's a lot easier to call Microsoft than [to pay an employee for the time required] to go through three or four manuals," Stephens said. "It's a very cost-effective way to have instant expertise."

"It's clear that when you buy a server product, you're buying a platform, so service is important," said Sam Jadallah, general manager of corporate support at Microsoft's Product Support Services organization. "You're looking beyond the particular version [of a product] and looking to a three- to five- to 10-year standardization."

Always in reach

Customers appreciate the ability to call in the middle of the night or on weekends and speak to a support engineer who will help them with a sticky problem or a failed server. In this worst case, Microsoft technicians will work around the clock until a problem is resolved, according to both Jadallah and customers.



Microsoft's Sam Jadallah: *Technicians will work around the clock to fix problems*

"In every case they don't have all the answers — nobody does — but they never say, 'I'm sorry, I can't help you,' like a lot of other people do," said Craig Restle, president of Systron, Inc., a Microsoft Solution Partner in New York.

"We've always gotten a [problem] resolution, [even when] sometimes it takes hours and several people," Restle said. "They're just like a dog after a bone."

Restle, whose company is also a Novell, Inc. Platinum reseller, said both companies offer excellent support. However, when one of his 24 engineers has to call Microsoft, he finds it reassuring to reach a support person right away.

"With Novell, you frequently leave a message, [and] they get back to you." While that usually works fine, "you cringe when you're at a data center waiting for them to call you back and someone else needs to use the phone," Restle said.

Worth the cost

Pricing for Microsoft's 7x24 Premier Support contracts varies and can be expensive, but Restle is not complaining.

"We tend to use the Microsoft support more than the others, so we've really gotten our money's worth," Restle said.

Internally, Microsoft has three levels of specialists to handle customers' problems, with escalation to the next level in each case until the problem is solved.

At the highest level, customers have access to the developers of the particular system or server, such as Windows NT or SQL Server. That level of service is one thing large-scale users expect from vendors and something that Microsoft recently realized it needs to provide.

PeopleSoft answers 4 critical client/server questions. (No asterisks, no equivocations.)

1. How many years of client/server experience do you have?	6
2. Do you have both financial and human resources applications available and in production?	Yes
3. Are all your applications developed from the ground up for client/server?	Yes
4. How many RDBMS platforms do your applications run on?	6

Ask other client/server vendors those questions. You'll find that most of them are still new to client/server. And not prepared to support you in a client/server environment.

At PeopleSoft, we'll give you direct answers to your questions. You'll find our open client/server solutions are in production. Today. At companies who are benefiting from our six years of experience with client/server software.

Only PeopleSoft applications give you a choice of six RDBMS platforms. So you can use the same applications whether you're upsizing to a mainframe, downsizing to a LAN, or rightsizing to anything in between. We build on the best of today's technology to reengineer traditional business systems. And deliver scalable, functionally innovative applications developed specifically for client/server and Windows.

That's why PeopleSoft client/server financial and human resource applications are the choice of 413 companies worldwide (as of June 1994). With more signing up every day. Our white paper, *Client/Server Business Solutions*, has the facts. For a free copy, and a schedule of our client/server seminars, please call us at 800/947-7753.

PEOPLESOFT

Run with it.

© 1994 PeopleSoft, Inc. All other company and product names may be trademarks of their respective owners.

Warp

CONTINUED FROM PAGE 43

Network, which Advantis will manage. Advantis is a partnership formed by IBM and Sears, Roebuck and Co.

Good intention

IBM also announced its intention to deliver a graphical web browser, called WebExplorer, which will be available to beta users in three or four weeks over electronic bulletin boards at no charge, a company spokesman said.

WebExplorer lets users move throughout the Internet with a graphical user interface designed to glue together the functions of services such as Gopher, Telnet and the file transfer protocol. Users who prefer not to use WebExplorer can still access the Internet through the individual icons for those functions.

To get onto the Internet via Warp, users click on the Internet folder, which initiates the onetime registration process and connects them with the IBM Global Network. As an introductory offer, users get 10 free hours of connect time.

Warp's E-mail capabilities will include IBM's UltiMail product, which lets users send and receive animated graphics and bit-mapped pictures as well as text through the Internet.

AMD chip fills gap in Intel line

By Michael Fitzgerald

■ Intel Corp.'s competitors may finally have a way to take advantage of the big chip maker's push to Pentium.

In March, Intel announced a high-end 486, the 33/100-MHz DX4. At the time, Intel anointed it as the mainstream desktop chip for 1994. But the company's decision two months later to shove aside the 486 in favor of Pentium put the DX4/100 low on its list of production priorities. The shift stunned some major systems vendors [CW, May 10].

As a result, numerous DX4/100 boxes that were announced have never really appeared. But competitors such as Advanced Micro Devices, Inc. (AMD) and Cyrix Corp. have not been in a position to offer their own alternatives, in part because they have lacked manufacturing capacity.

AMD says it finally has enough capacity to release a 33/100-MHz 486 clock-tripler that fits between the 25/75-MHz DX4 and the 60/90-MHz Pentium. Intel has staked this part of its market to the 60-MHz Pentium processor.

AMD disclosed its clock-tripler, due out in the fourth quarter, in conjunction with its recent announcement of a 40/80-MHz clock-doubling 486 processor, which fills a gap left open by Intel.

Room for two

Intel will be able to produce only 130,000 50/75-MHz Pentium chips for the notebook market this year, according to Mercury Research. This leaves a large window of opportunity for the 33/100-MHz DX4, analysts said.

"AMD is going to have a fairly hot product," said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz. McCarron said AMD should be able to leverage Intel's about-face on the DX4/100. "It's almost like Intel primed the pump for AMD," McCarron said.

Let's make a deal

Users say they will take whatever the best price/performance deal is, and for many, that means the 486 for now.

Pentium "is a pricing issue to us," said Ed Dombek, information center manager at Trustmark Insurance Co. in Lake Forest, Ill. Dombek said that once Pentium prices fall close to current 486 pricing, he will quickly move to Pentium. But his plans for the fourth quarter right now are to buy 486s, preferably based on the DX4/100.

Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass., said AMD's best shot is in the notebook market, Pentium's weak point.

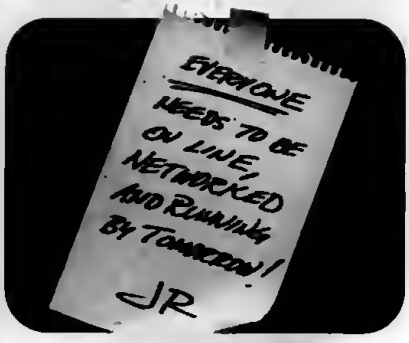
"Depending on Intel's Pentium pricing, the desktop may or may not be there, but the portable market will definitely be a volume market for DX4/100s," Giusto said.

Currently, most of Intel's DX4/100s have been targeted to notebook vendors. But the product is not being produced in large quantities, and Carl Everett, Intel's senior vice president at the microcomputer products group, said recently that Intel does not expect to generate enough volume to bring the DX4/100 to the desktop until the first quarter of next year.

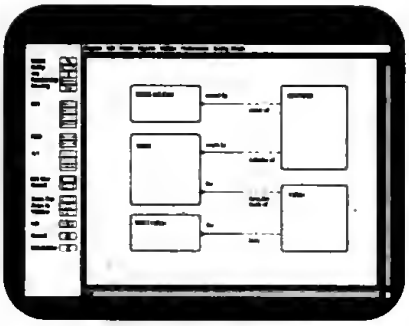
If AMD has a window in the market, it may be a slim one. Users contacted say they are looking seriously at moving to Pentium as Intel begins producing 60/90-MHz and 66/100-MHz Pentiums.

At Eaton Corp. in Cleveland, fully loaded 486s are "the minimum system we buy" as purchasing begins to shift to Pentium, said Fred Zickert, manager of microcomputer support.

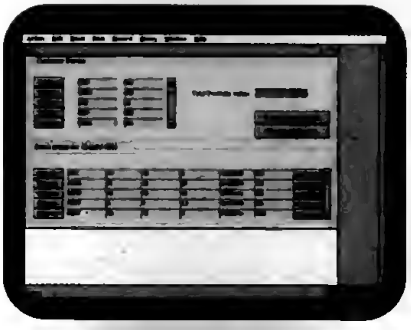
ORACLE CDE: HOW TO ACHIEVE THE IMPOSSIBLE



"Hope you didn't have any plans for the weekend"



"...Finance, Accounting, and our subsidiaries need to tie in to the financial tracking system..."



"...oh...did we mention that this needs to tie-in with our Portfolio Tracking System?".

Oracle CDE. The fastest way to build enterprise-scale client/server applications. For the CDE Technology

©1994 Oracle Corp

[redacted]

Apex Data, Inc. has announced the Cellular Direct modem, a PCMCIA modem.

According to the Pleasanton, Calif., company, the Cellular Direct modem was designed for plug connection to the data access port of a cellular phone and eliminates the need for data interface boxes for connectivity and dial-tone simulation.

The modem provides data transmission and reception via a portable computer or cellular phone. It stores information about the user's phone in read-only memory so it can instantly recognize the type of phone and provide the dial tone.

The Cellular Direct modem costs $329.

▶ *Apex Data*
(510) 416-5656

Apple Computer, Inc. has announced TapWorks, FormPad, Great Meetings and Diet Logic, applications for the Newton MessagePad.

According to the Cupertino, Calif., company, TapWorks integrates spreadsheet capabilities with more than 100 built-in functions. FormPad lets users create custom forms on a PC and download them to the Newton MessagePad.

Great Meetings provides agenda preparation, time goals, notes and scheduling for meetings. Diet Logic lets users set goals for diet and health improvement.

Great Meetings costs $69, and TapWorks, FormPad and Diet Logic cost $119.

▶ *Apple Computer*
(408) 996-1010

Smart Modular Technologies has announced the ST288VFC data/fax modem PCMCIA card.

According to the Fremont, Calif., company, the ST288VFC provides error correction, data compression, auto dial, auto answer and a fallback capability for compatibility with slower modems.

Full-duplex communication is available at speeds of 28.8K bit/sec., with fax transmission rates of 14.4K bit/sec. The card is compatible with many communications application software packages that support the standard EIA/TIA-578 Class 1 and Class 2 command sets.

The product includes a sleep mode that removes power from most of the card's internal circuitry to extend battery life, which is exited when a read, write or ring signal is detected.

The ST288VFC costs $499.

▶ *Smart Modular Technologies*
(510) 623-1231

Micro Express has announced the Regal/Multimedia/P90, a 90-MHz Pentium-based portable multimedia PC.

According to the Granda Hills, Calif., company, The Regal/Multimedia/P90 includes 8M bytes of RAM, 512K-byte RAM cache, a 420M-byte hard drive, a VL-bus hard disk controller, a video card, a Toshiba Corp. CD-ROM drive, a MediaVision Spectrum 16 sound card, two stereo speakers, DOS 6.21 and Microsoft Corp.'s Windows 3.1.

The video driver can drive the LCD display and an external Super VGA monitor simultaneously. A clock/calendar and built-in diagnostics are also provided.

The Regal/Multimedia/P90 costs $5,699.

▶ *Micro Express*
(818) 368-8212

Rancho Technology, Inc. has announced the RT7000, a 16-bit PCMCIA SCSI card.

According to the Ranch Cucamonga, Calif., company, the RT7000 operates on any Type II or III PCMCIA slot and lets users attach as many as seven SCSI peripherals, including CD-ROM drives, fixed disks, scanners, optical jukeboxes, erasable optical, write-once-read-many and tape drives.

The RT7000 was designed to operate on very low power and comes with active SCSI terminators that sense whether to activate the card.

The RT7000 costs $220.

▶ *Rancho Technology*
(909) 987-3966

Kantek, Inc. has introduced the Spectrum 3-D Wireless Ringmouse, a three-dimensional wireless mouse.

According to the East Rockaway, N.Y., company, the Spectrum 3-D Wireless Ringmouse is a pointing device that works on a user's finger and uses infrared and ultrasonic technology to track finger movements in front of the monitor and control the pointing arrow on the screen.

The product plugs into any serial port, and a low-voltage chip drives the infrared and ultrasonic controller, which operates on power from the PC.

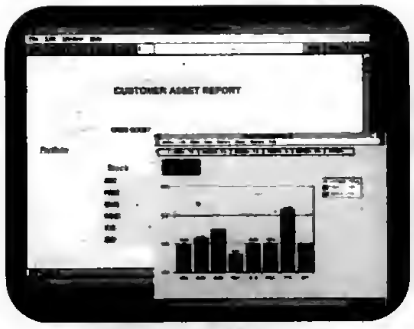
The Spectrum 3-D Wireless Ringmouse costs $99.

▶ *Kantek*
(516) 593-3212

Product short

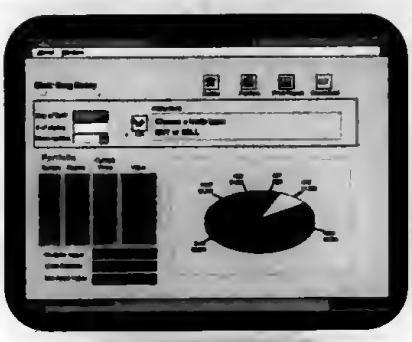
Klynas Engineering has introduced Streets on a Disk 6.0, road mapping software. The product lets users display detailed road maps and includes map searching capabilities and a router for travel directions and distances. It can also display database addresses along with text and scanned images. Cost: $225. Klynas Engineering, Simi Valley, Calif. (805) 583-1133.

AND STILL HAVE TIME FOR THE IMPORTANT THINGS.



[redacted]

"...how about we show all the data graphically?"



[redacted]

"It's perfect. It's beautiful. We love it..."

[redacted]

"Dad! Hurry up. We don't have all day."

and Executive Brochures that provide a complete overview of CDE products, call 1-800-633-1071 Ext.8150

ORACLE

Break the code barrier with VisualAge.

Introducing

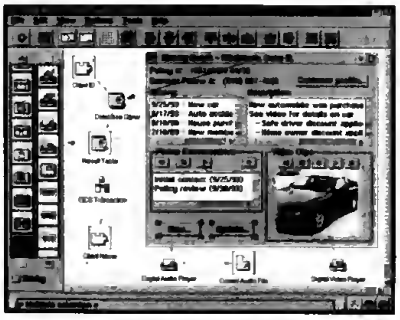
™

A powerful new vision of programming.™

Break the barrier. Extend the boundaries. Free yourself from the limits of what procedural programming can accomplish. Get out of the code mode and into the VisualAge.

VisualAge is IBM's powerful new object-oriented visual programming tool that lets you produce scalable client/server applications without rewriting yesterday's programs. And you can do it with amazing speed.

VisualAge supports development approaches that reward code reuse, so you don't have to spend time writing code you've already written. It gives you prebuilt, standard-compliant objects to get you started, intuitive graphical user interface tools, and the added flexibility of a completely integrated Smalltalk object-oriented base. And it's so extensible, you can even write your own add-ons.



Contact your favorite reseller or call 1 800 IBM-CALL, Dept. SM030.

See VisualAge for yourself. To order or to receive a VisualAge demonstration diskette, call 1 800 IBM-CALL, Dept. SM030 (in Canada, 1 800 465-7999, ext 657) or see your IBM representative. We'll show you how easy it is to make the barriers come tumbling down.

SOFTWARE FOR OBJECT-ORIENTED PROGRAMMING

IBM®

IBM is a registered trademark and VisualAge and A powerful new vision of programming are trademarks of International Business Machines Corporation. ©1994 IBM Corp.

Users watch, await power server maturity

By Jaikumar Vijayan

The recent flurry of high-end server announcements from vendors such as Compaq Computer Corp., Hewlett-Packard Co., AST Research, Inc. and Zenith Data Systems indicates these vendors may be seriously going after the database and application server markets, industry analysts said.

The systems, most of which are multiprocessor-capable, support 256M to 1G bytes of RAM and have up to 10G bytes of disk storage and optimized disk and network I/O architectures. They feature redundant arrays of inexpensive disks, server management and diagnostic software support.

The question is whether users really want the systems now. While the announcements clearly have piqued user interest, few seem in a hurry to purchase additional processors. Others are waiting until operating systems support becomes more widely available on multiprocessor platforms.

Support comes first

For instance, while users such as Aijaz Nawdhia, a LAN administrator at Burger King, Inc. in Miami, acknowledge that dual-processor systems make sense, they are not quite prepared to slap on the additional horsepower without adequate operating system support.

"We have looked at dual-processor systems and tried running our applications on them, but the operating systems just weren't there," Nawdhia said. If they did be-

Power servers, *page 52*

Wabi gets 'interface-lift' to enhance user appeal

By Jean S. Bozman

Wabi, Sun Microsystems, Inc.'s Windows-on-Unix answer to Microsoft Corp.'s lock on the Windows interface, will be revised in November to support more applications, according to Sun.

Wabi 2.0 will be a major revision of Sun's Windows translation interface, which industry analysts said has had very limited appeal, even at Unix sites, because it supports too few Windows applications.

SunSoft, Inc., Sun's software arm, recently said it had shipped 100,000 copies of Wabi as a no-charge item with Sun's Solaris 2.x operating system. It introduced Wabi 1.1 last spring to correct bugs that, according to some users and analysts, caused certain applications to slow or stop.

IBM and Hewlett-Packard Co. have shipped Wabi 1.1 since April with their Unix workstations, but they charge a fee for the SunSoft-supplied software module. HP charges $395 for Wabi 1.1, while IBM charges $249. The Santa Cruz Operation and Novell, Inc. are set to resell Wabi 2.0 with their Unix operating systems, Sun said.

Out of eight sites surveyed in recent weeks, few showed enthusiasm for Wabi 1.1.

"Although it did emulate most of the functions properly, it was too slow to use," said Pompi Malik, MIS director at Brewers Retail, Inc., a beer distribution chain in Mississauga, Ontario. "And a lot of the applications we use are not supported within the Wabi environment. So people still have two machines [a Unix workstation and a PC] on their desk, but we are hoping for a neat solution in the future."

Off to a slow start

Wabi, introduced in May 1993, was revised last spring as Wabi 1.1 to handle bug fixes and performance problems, analysts said. Wabi 2.0, which supports 20 Windows applications, is expected this fall.

13 going on 20

Andy Halford, director of engineering at SunSoft's PC Desktop Integration unit, said 13 major Windows applications have been certified for use with Wabi 1.1, and seven more are on the way in Wabi 2.0, including Lotus Development Corp.'s CC:Mail and Intuit, Inc.'s Quicken. "We found that those 13 applications account for over 60% of the shipments of PC software to the Fortune 500 companies," Halford said. "If you hit 20 applications,

Wabi, *page 53*

Middleware

IBM MQ series plays PeerLogic Pipes

By Elisabeth Horwitt

On the eve of the first meeting of the Message Oriented Middleware Consortium, middleware vendors announced initiatives that should make it easier for users to integrate their products.

Middleware, in this context, provides an underlying platform that enables an application on one system to request information or initiate a task on another system. Such products address a growing need at corporations to share information among departments, which may have very different combinations of client and server systems and transport protocols.

IBM and PeerLogic, Inc. in San Francisco announced that IBM's Message Queuing (MQ) series will work with PeerLogic's Pipes, so users can combine the two products' complementary features.

In particular, the MQ series provides an asynchronous message-queuing capability, which enables one system to query another without needing to ensure first that that system and the link to it are up and running, vendor spokesmen said. Pipes uses a synchronous communications paradigm that requires an ongoing session between the two interacting systems.

Fluent translation

Conversely, the MQ series running on Pipes will be able to take advantage of the middleware platform's ability to automatically translate between different operating systems and transport environments. Pipes will also provide the MQ series with dynamic rerouting around failures, said Steve Craggs, IBM's MQ series product manager. The MQ series runs over a variety of transport protocols and a growing number of IBM systems but does not provide translation between them.

In addition, melding the two products should make it much easier for users to develop middleware applications, said Mitch Kramer, a consulting editor at the Patricia Seybold Group, a consultancy in Boston. "The most difficult aspect of MQ interface is designing the network going between queues and channels; putting Pipes in should simplify that," he said. Conversely, MQ interface provides a higher-level interface for applications programmers, shielding them from communications underpinnings that Pipes' interface deals with, Kramer added.

One limitation is that applications written to Pipes cannot take advantage of the MQ series, a PeerLogic spokeswoman said. The MQ series is the higher-level interface, so applications written to IBM's middleware can run over Pipes but not vice versa, she said.

This is unfortunate for the Chicago Mercantile Exchange. The exchange is setting up an MQ interface-based application to collect transactions from some 75 to 80 clearinghouses, according to Steve Goldman, manager of technical planning for the futures exchange. The problem is that the organization is using Texas Instrument, Inc.'s Information Engineering Facility (IEF) computer-aided software engineering tool, which uses Pipes, he added.

"We don't want two message manager types of functionality on our OS/2 and MVS platforms," Goldman said. The Chicago Mercantile wants to use IEF to develop middleware across Pipes, and this, evidently, will not be possible even with the new integration of the two platforms.

IBM also announced it is purchasing EZbridge, middleware from Apertus Technologies, Inc./Systems Strategies that can talk to MQ series-based systems. EZbridge runs on a variety of non-IBM systems, including varieties of Unix and Digital Equipment Corp. VMS and Ultrix. IBM will sell both the MQ series and EZbridge under its own logo, providing customers with a one-stop middleware shop as well as its own support.

In addition, IBM plans to expand the MQ series' platform support to OS/2 and AIX later this year and to other Unix systems next year, Craggs said. The MQ series runs on IBM MVS and AS/400 systems.

Sweet harmony

IBM and PeerLogic claim that the integration of Pipes and the MQ series will give customers the following capabilities:

- Time-independent processing that provides asynchronous and deferred delivery transactions.
- Fully transactional messaging that ensures information is reliably stored and recoverable.
- Greater access to transactional systems.
- A single logical network view.
- Enhanced network administration.
- Advanced network support.

INTRODUCING A COMPU
WELL ENGINEERED,
ACTUALLY IMPROVES WI

intel inside

TER SO
IT
TH AGE.

One of the most impressive features of the Deskpro XL is its future. Its upgradeability, expandability and flexibility (and countless other Compaq-engineered abilities) are all designed to protect your investment

If you use a powerful computer, you know how it works: The day you bought your last machine was the day you started thinking about your next one. For that reason, we'd like to introduce you to a computer you can always look forward to – the new Compaq Deskpro XL.

Basically, we've designed the Deskpro XL to be everything you could ever want in a high-performance desktop computer. A new high at the high end. So not only did we build in our own industry-leading technologies, we added the flexibility and expandability that will make it possible for you to take advantage of advances still to come.

It's showtime. Spectacular graphics capabilities we built into the Deskpro XL, combined with the VESA Advanced Feature Connector, lay the groundwork for high-end design work and video conferencing

Deskpro XL's powerful PCI local bus, with integrated 32-bit Fast SCSI-2 and Ethernet capabilities, lets you add the most advanced features – while its EISA slots offer compatibility with the thousands of existing options. You also get super-fast QVision PCI graphics with crisp 1280 x 1024 resolution. So with the Deskpro XL, you enjoy maximum performance today, with a door wide open for future growth.

It's fast. Oh, is it fast. And the good news is, it will only get faster. The Deskpro XL's advanced architecture makes it easy to upgrade to future processors – so you'll be able to buy more speed without buying a new computer

Standard equipment, of course, includes the Compaq commitment to quality, dependability and value. Which comes in the form of our free three-year warranty* and our free seven-day, 24-hour support.

Our Vocalyst keyboard has a built-in speaker, microphone and controls for Business Audio – so the complete power of business communication will always be right at your fingertips

The Deskpro XL makes upgrading a lot easier with its Plug and Play capabilities. Servicing is a snap, too – no special tools required

The Deskpro XL starts at $2,599** and is available now at your nearest authorized Compaq reseller. If you'd like more details via fax, call us at 1-800-345-1518, select the PaqFax option and request document #4052. You'll find that the future has never looked better.

COMPAQ

©1994 Compaq Computer Corporation. All Rights Reserved. Compaq and Deskpro Registered U.S. Patent and Trademark Office. Vocalyst is a trademark and PaqFax is a service mark of Compaq Computer Corporation. Headline News is a registered service mark of Cable News Network, Inc. Pentium and the Intel Inside logo are registered trademarks of Intel Corporation. *Certain restrictions and exclusions may apply. Monitors, battery packs and certain options are covered by a one-year warranty. Call the Compaq Customer Support Center and select the PaqFax option for more details. **Estimated selling price; actual pricing may vary.

When's the best time to upgrade your network and get a $4,700 workgroup productivity pack, Free?

NetWare

Cyrix offers open standard

By Jaikumar Vijayan

Users thinking of slapping two or more processors into their Intel Corp. server boxes may not have to be tied to the chip giant's Pentium line if a new multiprocessor architecture from Cyrix Corp gains wider acceptance.

Cyrix last week announced its SLIC/MP open interrupt architecture for multiprocessor desktop systems that will support x86 and PowerPC implementations. The architecture's specifications will allow PowerPC as well as other RISC/CISC architectures to be implemented on standard desktop servers. Cyrix said the specs have already been endorsed by several companies, including IBM Microelectronics, Motorola, Inc. and about 12 chip set vendors

Analysts, including Dean McCarron at Mercury Research in Scottsdale, Ariz., said Cyrix's new "open" architecture could be a move to counter Intel's closed Advanced Programmable Interrupt Controller architecture for multiprocessor systems. While intel's interrupt controller locks OEMs and systems integrators into its processor road map, Cyrix's multiprocessing architecture will accommodate several processor implementations and types, McCarron said.

The SLIC/MP, which can be integrated into existing single-processor chip sets, will be made available to vendors and systems integrators, without patent or licensing restrictions, royalties or licensing fees.

Power servers

CONTINUED FROM PAGE 49

come available, he said he would consider the option.

At the same time, Nawdhia, who uses Compaq servers for most of Burger King's major applications, said he is confident that PC vendors such as Compaq can move further up the enterprise with their architectures. As features such as hot-pluggable drives, remote diagnostics, server management software and "increasingly smarter databases" become widely available, "the gap between PC architectures and those from companies like Tricord is going to narrow," Nawdhia said.

Michael Parrott, a LAN administrator at Restaurant Services, inc. in Miami, has not yet reached the performance plateau on his PC servers, nor does he expect to yet. So far, he has upwardly scaled his servers by adding memory, controllers and mainly "configuring the system sensibly," he said.

Still, Parrott said he wants to see more multiprocessor technology on intel Corp. architecture. "Multiprocessor doesn't mean anything yet unless you are going to use Windows NT. Even then, you are going to be breaking new ground," he said.

All in the approach

A lot will depend on how traditional PC vendors approach database and application server markets, analysts said.

"If you are going to put your database on a PC server, you want to feel very well-protected. Vendors have to guarantee availability, security and reliability. They really have to make it bulletproof to get users to migrate all that stuff off mainframes," said James Greene, an analyst at BIS Strategic Decisions in Norwell, Mass.

Analysts, such as John Daly at Summit Strategies in Boston, said there are other issues. "The channels also are very different. There are a lot more distribution, support and service issues that need to be addressed here," compared with the PC market, Daly said.

There are indications that the migration to database and application servers may have already begun. A late 1993 study by Summit Strategies on the database and application server market revealed that the most significant growth for superservers will come from database and related application servers.

Almost 60% of corporations are either piloting or beginning to implement client/server projects, and a growing number of them are moving into full-scale deployment. The report suggested that by year's end, superserver users will expect a major portion of their systems' processor performance to be dedicated to running databases rather than operating systems.

Summit predicts that Microsoft Corp.'s Windows NT Advanced Server will become one of the major operating systems on multiprocessor platforms.

Source: International Data Corp., Framingham, Mass.

Cheyenne leaps into hierarchical storage ring

By Tim Ouellette

Cheyenne Software, Inc. is hoping its reputation and position in backup utilities will help its expansion into full-fledged hierarchical storage management (HSM).

Like other products entering the market from competitors Alphatronix, Inc., Conner Peripherals, Inc. and Palindrome Corp., Cheyenne's Hierarchical Storage Manager 1.0 automatically moves lesser-used files from primary storage on a server to lower-cost secondary optical or tape storage devices. This lets users directly access these files instead of waiting for an administrator to restore an older file from primary backup.

Bob Abraham, an analyst at Freeman Associates in Santa Barbara, Calif., said the key advantage for Cheyenne is its backup utility, Arcserve. "Users will say that these are the guys that invented Arcserve, so they will understand what will take place when you drop an HSM product into the system," he said.

Hierarchical Storage Manager does not require a terminate-and-stay-resident program on the client workstation, so users can use any Novell, Inc. NetWare client available. The system offers a choice of magnetic, tape or optical device types at each level of the hierarchy below primary storage. This flexibility lets administrators design their own storage management system.

The product has a Windows-based interface for migration scheduling, reporting and analyzing utilities and database management for all hierarchy levels.

Mike Marbury, an analyst at Meta Group, Inc. in Reston, Va., said that because HSM for PC LANs is still catching on, these products are not going to sell much in the next nine to 12 months. "The key issue is to educate users about this type of solution," he said.

Hierarchical Storage Manager 1.0 costs $6,995 for the base package. Cheyenne plans to offer an updated version of Arcserve to provide optimal integration of the two products.

Wabi appeal

CONTINUED FROM PAGE 49

you can hit about 90% of the volume."

However, some industry analysts said even with Wabi 2.0, the Wabi technology will still be too limited for widespread use. "Running the 20 leading applications certainly doesn't cover all the possible needs," said Terry Bennett, director of technical systems research at Computer Intelligence/InfoCorp in Beaverton, Ore. There are thousands of Windows applications, he said, and users can run any of them on Windows PCs. Other users have Insignia Solutions, Inc.'s SoftWindows, an emulation program built on Microsoft code that supports all Windows applications, according to Bennett.

Wabi, originally an acronym for Windows Application Binary Interface, was announced in May 1993 and shipped in September 1993. A translation technology, Wabi lets Windows application code run on top of Unix operating systems and the X 11 R5 windowing standard from the X Consortium in Cambridge, Mass.

Users said Wabi works well enough to run applications such as Microsoft's Excel, PowerPoint or Project on Unix workstations. It saves them from having to walk to another office to run Windows applications on a PC and lets them share data with other departments standardized on PCs and Windows software.

Some users have even used shared copies of Wabi, running on a Unix server, to reduce the disk space needed to store Wabi on each client workstation. Bill Patterson, a systems manager at the University of Wisconsin business school in Madison, Wis., said several X terminal users at his site share a copy of Wabi running on a Sun SPARCstation 10, along with a multiuser version of Excel.

"It's just like sharing other packages. It's just an executable [code] that you can run [in] multiple copies," he said. Some of the graduate students have been managing their financial portfolios using Windows-based Excel but now have the option of using Applix, Inc.'s Unix spreadsheet, which was added to the Sun server this summer, Patterson said.

User complaints

Users acknowledged that Wabi has not been free of problems, but some stopped short of detailing those problems on the record. Others said they were frustrated enough, however, to limit their use of Wabi or avoid it altogether. One oil firm tried Wabi, then decided to spend the extra money to have engineers use Unix workstations and separate Windows PCs.

At AT&T Network Systems in Columbus, Ohio, users found that Wabi 1.1 allowed them to use company standard Windows applications such as Microsoft's Project on Sun workstations, according to Scott Elliott, a member of the technical staff. "A lot of times people in other departments who have PCs give us graphics to include in our presentations, and we give them graphics to include in theirs," Elliott said.

He also said he tried a Windows-based drawing application from Micrografx, Inc. in Richardson, Texas, that has not been certified for Wabi, and it worked.

Halford said that is not unusual — about 50 Windows applications not officially certified for Wabi can be used without difficulty. However, industry analysts warned that undocumented Windows system calls can halt or slow performance on such uncertified applications.

Now.

If you're planning to upgrade your network sometime in the future—the future has just arrived.

Novell has pulled together a tremendous offer to make it cost-effective for you to upgrade to either NetWare® 3.12 or NetWare 4.02 right now. So whether you're moving from peer-to-peer to client-server or want to expand the performance and capabilities of your current system, Novell has the most proven, advanced network operating systems available. All at upgrade prices that have just been reduced.

What's more, when you upgrade any network to NetWare 3.12 or 4.02 for ten or more users by October 31, you'll get Novell's workgroup productivity package worth $4,700—free. The pack includes GroupWise™ (formerly WordPerfect Office), the most comprehensive E-mail, scheduling and calendaring, task management program, plus a Message Server NLM and MHS NLM Gateway. So call 1-800-BUY NOVL or your local Novell reseller to find out more. Because there's never been a better time to upgrade your network and workgroup productivity.

NOVELL

The Past, Present, and Future of Network Computing

CALL 1-800 BUY NOVL

The Client/Server Solut

The SAS System for Information Delivery is a new concept in client/server software. It provides workable strategies for overcoming the barriers that stand between people and the information they need. For instance, the SAS System strategy for **universal data access** makes it easy to reach all your diverse "islands of information"— including host system files, flat files, and corporate DBMS's such as DB2®, ORACLE®, and dBASE®.

An exclusive MultiVendor Architecture™ is behind the SAS System's strategy for **hardware independence**. Applications run the same way across PCs, workstations, and host systems—making true client/server computing a reality while exploiting the particular strengths of each platform.

Address the needs of users at every level with the SAS System's strategy for **interface versatility**. An EIS interface puts decision makers in command of the facts—when they need them. There's also a task-oriented menu-driven interface for business

The SAS

Enterprise Wide In

ion for EIS and Beyond

analysts... plus object-oriented and full-function programming environments for applications developers.

The SAS System's **applications integration** strategy provides one seamless solution for virtually any application that involves accessing, managing, analyzing, or presenting data. Choose integrated tools for decision support, reporting, financial analysis, market research, project management, quality improvement, and more. All backed by SAS Institute Inc., a vital force in the information industry with a strong commitment to helping you succeed—and an unrivaled dedication to training, documentation, technical support, and consulting services.

See for yourself how the SAS System of software brings out the best in your hardware and the people who use it. Just give us a call at **919-677-8200** for a free video, plus details about a free software evaluation.

SAS®

SAS Institute Inc.
Phone 919-677-8200
Fax 919-677-8123

SAS is a registered trademark of SAS Institute Inc.
Copyright ©1993 by SAS Institute Inc.

System®

formation Delivery

Axil Computer, Inc. has announced the Axil 320 and Axil 245 workstations and the AxilServer S/311 departmental server.

According to the Santa Clara, Calif., company, the Axil 320 is a Sun Microsystems, Inc. SPARCstation 20-compatible workstation, and the Axil 245 is a SPARCstation 5-compatible workstation with an 85-MHz CPU. Both feature multiprocessing architectures.

The AxilServer S/311 is a deskside server with a modular architecture that lets users upgrade from the Axil 311 workstation by adding stackable media and disk drive boxes for up to 24G bytes of storage.

The server's multiprocessing architecture allows up to four CPUs. All three products offer both HyperSPARC or SuperSPARC microprocessors.

The Axil 320 costs $15,300, the Axil 245 costs $11,380, and the AxilServer S/311 costs $20,000.

▶ *Axil Computer*
(408) 486-5700

Rupp Technology Corp. has announced WinLynx, PC-to-PC file transfer software.

According to the Phoenix company, WinLynx lets users move and manage files between connected PCs while remaining in Windows.

Features include drive and directory synchronization options, resource sharing and background file transfers.

The product provides cross-directory tagging, retagging, reverse tagging and searching by selected attributes.

WinLynx costs $169.

▶ *Rupp Technology*
(602) 224-9922

Creative Interaction Technologies, Inc. has announced AshWin, a Windows-based job scheduler.

According to the Chapel Hill, N.C., company, AshWin provides mainframe functions such as automated batch, repetitive, dependent and background processing to client/server networks.

AshWin maximizes idle microprocessing power across a Windows TCP/IP or Novell, Inc. NetWare network so administrators can schedule, control and monitor automated batch processing. No manual intervention is required for tasks to be processed once a schedule has been created.

Prices start at $1,495.

▶ *Creative Interaction Technologies*
(919) 489-6300

LAN-Aces, Inc. has introduced OfficeLogic for Windows, a groupware product.

According to the Houston firm, OfficeLogic for Windows runs on all network operating systems, uses existing hardware and provides users with instant access to integrated electronic mail, group and personal scheduling, phone messaging and databases.

The product includes wide-area network support for remote groups, on-line conferencing and faxing through most fax gateways.

Prices range from $495 to $4,995, depending on the number of users.

▶ *LAN-Aces*
(713) 890-9787

Product short

Spectrum Computer Technologies Corp. has announced Complaints Desk for Windows, customer relations software. The product lets users record, organize and monitor customer complaints, requests and suggestions. Features include graphing, querying and word processing. Cost: $179. Spectrum Computer Technologies, Niagara Falls, N.Y. (716) 283-0825.

Get in the fast lane
to workgroup document management.

You want a powerful yet easy way to manage your data, *and you want it fast.* Take advantage of our workgroup document management solution to speed you to productivity with:

Fast retrieval. Organize your documents and access them quickly regardless of file formats or storage location.

View and redline. View your document and mark it up without making changes to the original.

Editing. Check out your document and automatically launch the editing application, including *AutoCAD, MicroStation,* and *Microsoft Word* and *Excel.*

Expandability. Add additional modules that let you capture your data or build a graphical workflow for your projects.

***DM/Librarian for Windows, DM/View,* and *DM/Redline* — Intergraph's workgroup document management solution.**

INTERGRAPH
Solutions for the Technical Desktop

For more information or the number of a salesperson or Business Partner in your area, call 800-345-4856 or 1-205-730-5499.

Intergraph and the Intergraph logo are registered trademarks and Solutions for the Technical Desktop, DM/Librarian, DM/Redline, and DM/View are trademarks of Intergraph Corporation. MicroStation is a registered trademark of Bentley Systems Inc., an Intergraph affiliate. Other brands and product names are trademarks of their respective owners. Copyright 1994 Intergraph Corporation, Huntsville, AL 35894-0001 DDAD20040

RECRUITING TALENT FOR WASHINGTON DC?

Advertise in the September 26th Eastern Edition when Computerworld's regional Careers feature examines "IS Careers in Washington DC." Ad Close: September 22.

800 343-6474, x201

	ORACLE	SYBASE® System 10™	INFORMIX
Parallel Processing Strategy	YES	YES	YES
			YES
Parallel OLTP Software	YES	NO	YES
			YES
Parallel Index Software	YES	NO	YES
			YES
Parallel Backup	YES	YES	YES
			YES
Platforms Supported with Parallel Software	20+	Ø	25+
			YES
Parallel Resource Management and Control	NO	NO	YES
			YES
Static Database Partitioning	NO	NO	YES

Here's Why Oracle Isn't Attacking Informix.

In recent advertising, Oracle has failed to compare their parallel database software to Informix.

We know why.

INFORMIX-OnLine Dynamic Server™ delivers all the features they claim—and more. And OnLine Dynamic Server performs better in identical configurations. That's because Informix has a superior parallel architecture—Dynamic Scalable Architecture™—as a number of *independent* industry analysts have pointed out.

Peter Kastner, Aberdeen Group:
"Sybase and Oracle lack the clarity of Informix's architecture. They're going to have to go back to their labs."

John Merrell, International Data Corporation:
"The Informix Dynamic Scalable Architecture has the potential to vault Informix past its primary competitors for high-end database processing functionality."

David McGoveran, Alternative Technologies:
"The new Informix database server architecture will put the vendor ahead of competitors Oracle and Sybase in support of multiprocessing systems."

Rob Thalemeier, Meta Group:
"Informix may have the best scalable server technology today.... I think people are mistaken in not taking the time to really look at Informix."

Call Informix at 1•800•688•IFMX, ext. 31 and we'll send you the independent reports.

INFORMIX®

© 1994 Informix Software, Inc. Informix is a registered trademark of Informix Software, Inc.
All other names indicated by ® or ™ are registered trademarks or trademarks of their respective owners.
Portion of table reproduced from Oracle ad © 1994 Oracle Corporation in 7/11/94 issue of *Computerworld*.

Thousands Of Companies Depend On Microsoft To Run Their Businesses. Did You Ever Wonder Who Microsoft Depends On To Run Theirs?

As one of the largest developers of software in the world, with hundreds of thousands of customers around the globe, there's just one thing about Microsoft that people sometimes overlook: That they've got a business to run too.

A business with people who need constant (and instant) access to crucial information–like customer service records and problem/solution databases. And a Microsoft® Windows NT™ Server network that not only serves their headquarters near Seattle but all of their offices around the world. So they need to have server systems they can count on.

Which is why they rely on Compaq.

Because Compaq provides reliable servers that keep running. Servers that allow you to configure Microsoft Windows NT Server simply and easily with one CD. And Compaq has servers that come with Insight Manager, which is a specially designed Compaq technology that manages over 800 key server elements and warns you about potential problems. Before they become real ones.

And because they're Compaq servers, each one is backed by our three-year on-site warranty* and our 7 day a week, 24-hour technical support line.

So if you're looking for a powerful and reliable system to help you run your business, give us a call at 1-800-664-9888. But do yourself a favor, don't just take our word for it. Ask around.

COMPAQ

© 1994 Compaq Computer Corporation. All Rights Reserved. Compaq Registered U.S. Patent and Trademark Office. Microsoft is a registered trademark of the Microsoft Corporation. Windows NT is a trademark of the Microsoft Corporation. Insight Manager is a registered trademark and ProLiant is a trademark of Compaq Computer Corporation. *Limited warranty. Certain restrictions and exclusions apply. Monitor, battery packs and certain options are covered by a one-year warranty. For details, call the Compaq Customer Support Center at 1-800-34-1-1[illegible]

Imagine you had the same choice in internetworking partners.

Which one would you select?

At Wellfleet, full service means you get more. First, a partner who listens to your needs and architects the right internetworking solution for you. Second, our family of multiprotocol routers and multiservice WAN switches offers the industry's highest availability and performance with support for every network environment from SNA to ATM. And finally, Wellfleet provides worldwide support for your internetwork every hour of every day. So get the service you fully deserve. Give Wellfleet a call at 1-800-989-1214, extension 33.

© 1994 Wellfleet Communications, Inc.

WELLFLEET

Price is right for ATM suite

Users reluctant to commit without standards

By Stephen P. Kiett Jr.

First Virtual Corp last week rolled out an Asynchronous Transfer Mode (ATM) product suite aimed at driving multimedia applications to the desktop at prices ranging from $500 to $800 per seat. Observers were impressed with the company's strategy and products but said it faces a major hurdle in persuading business users to commit to the products in a pre-standards environment.

Start-up First Virtual in Santa Clara, Calif., was formed by Ungermann-Bass, Inc. founder Ralph Ungermann, who serves as chief executive officer. To hit its aggressive price levels, the firm is building its desktop ATM strategy on 25M bit/sec. technology and proprietary software called the Multimedia Operating System (MOS), which acts as an interface between ATM and legacy LAN applications [CW, Sept. 12].

"First Virtual is coming up with a solution where other vendors are offering technology," said Jennifer Pigg, director of data communications at The Yankee Group in Boston. However, to provide users with an end-to-end desktop ATM network, First Virtual is taking a risk because it is moving ahead of standards, Pigg said.

"Ralph Ungermann must do a good job of giving users quantifiable assurance that future software updates won't bring users' applications to a screeching halt," she said. However, even with this assurance it will be difficult for First Virtual to get users to run their mission-critical applications on the technology, she added.

On the rise

Only 5 million Windows-based multimedia PCs shipped last year, according to Dataquest, Inc. But, the market researcher says that number will hit 23 million by the end of 1995. Research firm Hambrecht & Quist, Inc. said the interactive video applications market will be worth $2 billion to $4 billion by 1997.

Users are cautious

"I think that business is probably not the right market for a start-up to target because business users will need something standard to ensure interoperability and support," said David Pinkard, technical consultant at Mallinkrodt Medical, Inc. in St. Louis. "Although we want to move ahead quickly with multimedia, I'm not sure I'd look seriously at this because I need to know, will it work with what I've got and will it coexist" with network operating system applications.

Pinkard said he also needed to know how it would be managed — whether he could manage it through Hewlett-Packard Co.'s OpenView, for instance.

First Virtual is taking steps to address these questions. For example, its list of third-party support includes Novell, Inc. and Lotus Development Corp. Microsoft Corp. support is forthcoming. And the MOS, adapters and hubs include Simple Network Management Protocol agents to allow them to be integrated into management platforms such as OpenView, the company said.

Some observers said these steps — combined with the low prices — will eventually win over cautious users.

"I feel the questions are minor issues in the bigger light of someone taking ATM in a new direction," said Valentin Sribar, a program director at Meta Group, Inc. in Reston, Va. "Plus, it'll cost only about $10,000 for users to get it up and running, which isn't a big risk. They can bring it in and play with it for a while at that price."

Ready to roll

By Jan. 1, First Virtual will deliver the following products:

▶ **MOS:** Operating system software that sets up separate ATM paths to carry voice, data and video traffic. Supports Microsoft's Object Linking and Embedding, which will allow users to pull video and voice clips into word processing and spreadsheet applications. Prices start at $2,000 for a 10-user license.

▶ **Media Server:** A redundant array of inexpensive disks server from partner Conner Peripherals, Inc. with built-in MOS that provides real-time storage and retrieval of video, audio and image data over ATM. Initially, the server will be available in 4G- and 8G-byte versions for $15,000 and $20,0000, respectively.

▶ **Media Switch:** Provides eight to 24 full-duplex 25M bit/sec. desktop connections over Category 3 unshielded twisted-pair copper wiring. For higher-speed connectivity for devices such as servers, 51M, 100M and 155M bit/sec. interfaces will be available. Prices start at $3,400.

▶ **Media Adapter:** Software-based network interface cards that support ATM and provide transparent access to legacy LAN traffic. The cards support ATM Forum Class of Service and Quality of Service definitions. Prices start at $350.

ISDN answers talent agency's bandwidth casting call

By Ellis Booker

Listed among the William Morris Agency's 3,000-plus clients are some of the world's hottest new celebrities and entertainers.

But network manager Mike Clark is a fan of a relatively old performer: Integrated Services Digital Network (ISDN).

"We didn't have a viable backup for our TCP/IP network without putting in another dedicated line, and we weren't really sure how much bandwidth we'd need long-term," Clark said.

The new network also helps with backup tasks and will support a new database being rolled out at the company.

In January, the Beverly Hills, Calif., agency added ISDN lines to replace modem connections between its headquarters and offices in London. It also added ISDN connections to back up fractional T1 connections between Beverly Hills and New York (112K bit/sec.) and Beverly Hills and Nashville (56K bit/sec.).

The international ISDN Basic Rate Interface lines are supplied by AT&T Corp., which also handles the fractional T1 lines.

Routers from Network Express, Inc. in Ann Arbor, Mich., handle both the ISDN connections and the fractional T1 lines and can automatically shift traffic to the ISDN if the leased line connections fail.

"The last time our leased line failed it took us a while to realize it because the ISDN line simply picked up the slack and provided uninterrupted communications," Clark said.

The ISDN lines and fractional T1s were also needed for dial-up bandwidth to support a new, database application now being deployed to the company's 500-person staff worldwide.

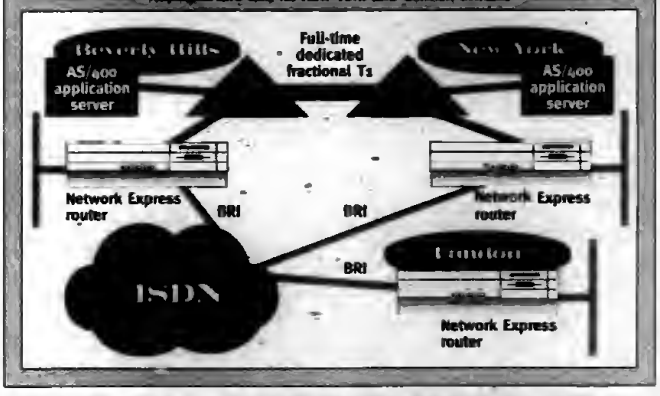
The homegrown database application, now being used in the Beverly Hills office and rolling out to the rest of the company this month, includes extensive contact lists, as well as phone log and project management modules.

"The database application is on a server here in Beverly Hills," Clark said. "The people in New York City will access it over a T1.... But if that T1 goes down, they're out of business."

Built in NextStep, the object-oriented programming language, the database application runs on a Data General Corp platform under a relational database from Sybase, Inc. Clark says he would like to move William Morris' 2-year-old image database application to this server, which would again increase the firm's network bandwidth needs.

William Morris' wide-area network

The William Morris Agency is using ISDN Basic Rate Interface (BRI) lines for redundancy and to handle overflow from its dedicated T1 network. ISDN is the primary network between its Beverly Hills, Calif., headquarters and its New York and London offices.



[illegible]

Lower-cost backup server seeks niche

By Suruchi Mohan

Vinca Corp. has announced a fault-tolerant network server for companies that can afford a few minutes of network downtime.

Remote StandbyServer is meant to be installed at a branch office that could be hundreds of miles away from the primary server. It connects into the primary server through T1/E1 links leased from a public carrier. Essentially, Remote StandbyServer's disk mirrors the hard drive of the main server.

Users said they think the product has great potential for easing network administrators' woes in the event of a disaster. Jeffrey Syring, a network engineer at Wausau Hospital in Wausau, Wis., said he plans to install Remote StandbyServer when it becomes available in the fourth quarter. He said it would be good to have a "hot backup off site. If a disaster happens at one site, we could get to the backup server."

Although functionality comparisons to Novell, Inc.'s System Fault Tolerance (SFT) III are inevitable, Jay Carlson, president of Salt Lake City-based Vinca, said Remote StandbyServer will appeal to a different audience. "We are aiming at a market that can tolerate a minute or two of delay. SFT III is for nonstop computing," he said.

With Novell's SFT III, the backup server takes over automatically, preventing lost connections. This is not the case with Remote StandbyServer. Vinca users lose the connection when the main server goes down.

Syring said, however, that Remote StandbyServer's cost advantage will steer him toward that route. He can easily upgrade to Novell's product later if he needs to, he added.

Remote StandbyServer uses wide-area network interface cards from Newport Systems, which was recently acquired by Cisco Systems, Inc. The Vinca software is located on these cards.

INTERSOLV's ODBC Connects To:
ALLBASE
Btrieve
Clipper
DB2
DB2/2
DB2/6000
dBASE
Excel .XLS files
FoxBase
FoxPro
Gupta SQLBase
IMAGE/SQL
INFORMIX
INGRES
Microsoft SQL Server
NetWare SQL
Oracle
Paradox
PROGRESS
SQL/400
SQL/DS
Sybase
Sybase SQL Server
Teradata
Text files
XDB

Operating Systems Supported:
Windows
OS/2
Windows NT
Macintosh
Solaris

One Development View

INTERSOLV's cross-platform data accessware is for developers building database-independent applications using ODBC. Our unique, thinly layered approach leverages productivity and insulates your application without blocking access to key DBMS functionality. With INTERSOLV, you code and maintain a single set of highly efficient source code regardless of the number of different data sources.

Many Deployment Options

Using INTERSOLV's drivers, you can link any ODBC-enabled software to your choice of over 30 different data stores. Even ODBC applications not built using INTERSOLV's developer kit are eligible. Most important, our ODBC drivers are fast and memory efficient—unlike other ODBC drivers that hamper performance. So, if you need to link Excel to dBase, Lotus 123 to SYBASE or Access to INFORMIX, check out INTERSOLV's ODBC drivers

Call 800-294-2790 to sign up for a FREE seminar, "Building and Deploying ODBC Applications"

Chicago	9-27
Minneapolis	9-28
Cleveland	9-29
San Francisco	10-11
Los Angeles	10-12
Seattle	10-13
NYC	10-18
Parsippany, NJ	10-19
Toronto	10-20
Philadelphia	11-2
Pittsburgh	11-3
Washington, DC	11-4
Atlanta	11-15
Charlotte	11-16
Miami	11-17
Dallas	11-29
Kansas City, KS	11-30
Houston	12-1

INTERSOLV with ODBC is the Answer!

The Standard for Client/Server Data Access

Building or deploying an ODBC-enabled application?

Call today: 800-876-3101, ext. DO44

INTERSOLV

© 1994 INTERSOLV, Inc. All rights reserved. INTERSOLV, Excelerator, Maintenance Workbench, PVCS and Q+E are registered trademarks and APS is a trademark of INTERSOLV, Inc. Other company or product names mentioned herein may be trademarks or registered trademarks of their respective companies.

Briefs

DEC shakes with Proteon

Digital Equipment Corp. has inked a licensing agreement to integrate key components of Proteon, Inc.'s internetworking software into its hubs, routers and switches. The software includes Token Ring and SNA integration technology.

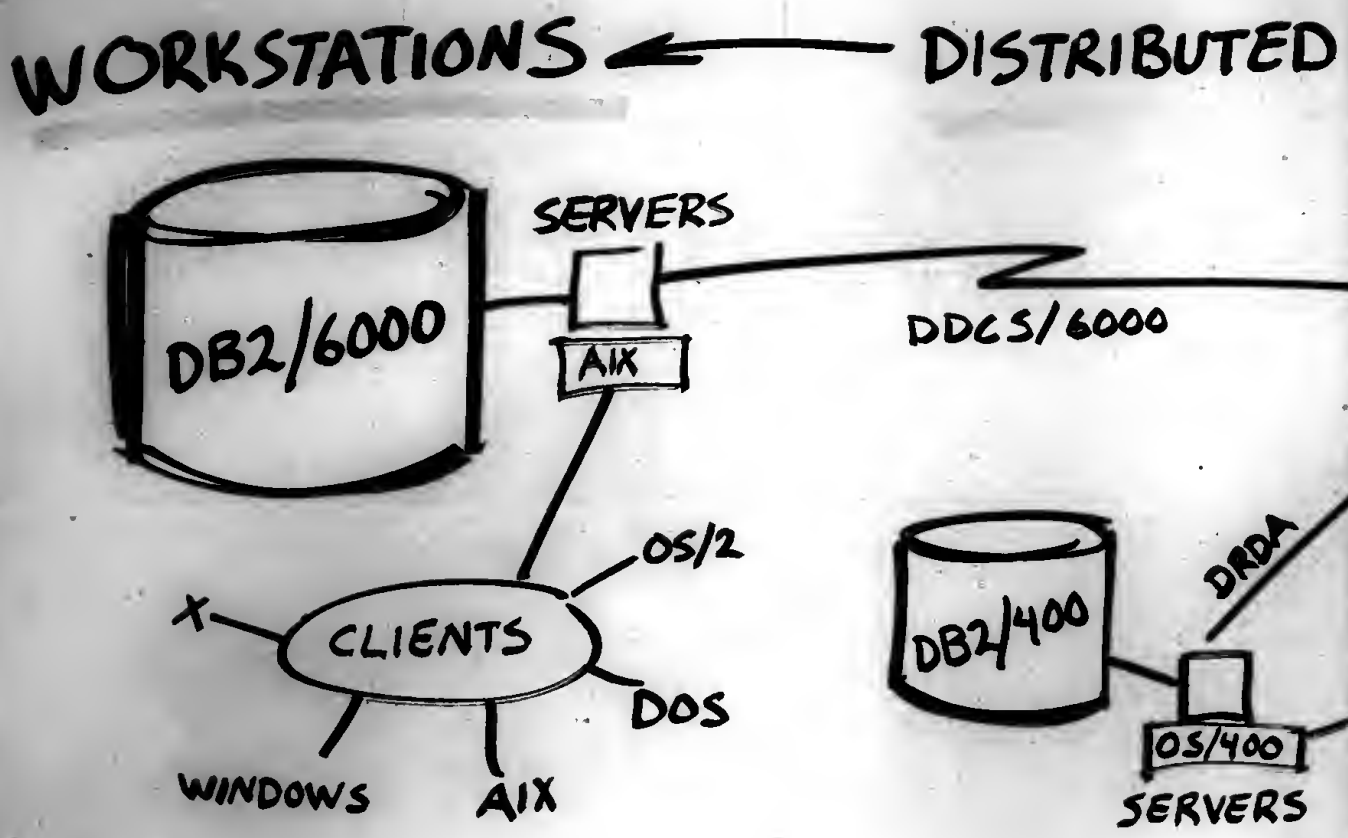
CompuServe ISDN

CompuServe, Inc.'s 14.4K bit/sec. modem support is going to get even faster. The Columbus, Ohio, company's Network Services Division has announced it will begin testing 1-800 Integrated Services Digital Network (ISDN) access. Pricing for ISDN connections has not been set. Separately, the CompuServe unit announced last week it had joined the NetView Association and hopes to migrate all its network offerings to the NetView/6000 management platform, beginning with its global frame-relay service, Frame-Net.

Networking in China

General DataComm, Inc. in Middlebury, Conn., announced a joint venture to provide the first Asynchronous Transfer Mode network in China.

Where can you safely put your data in a distributed environment?



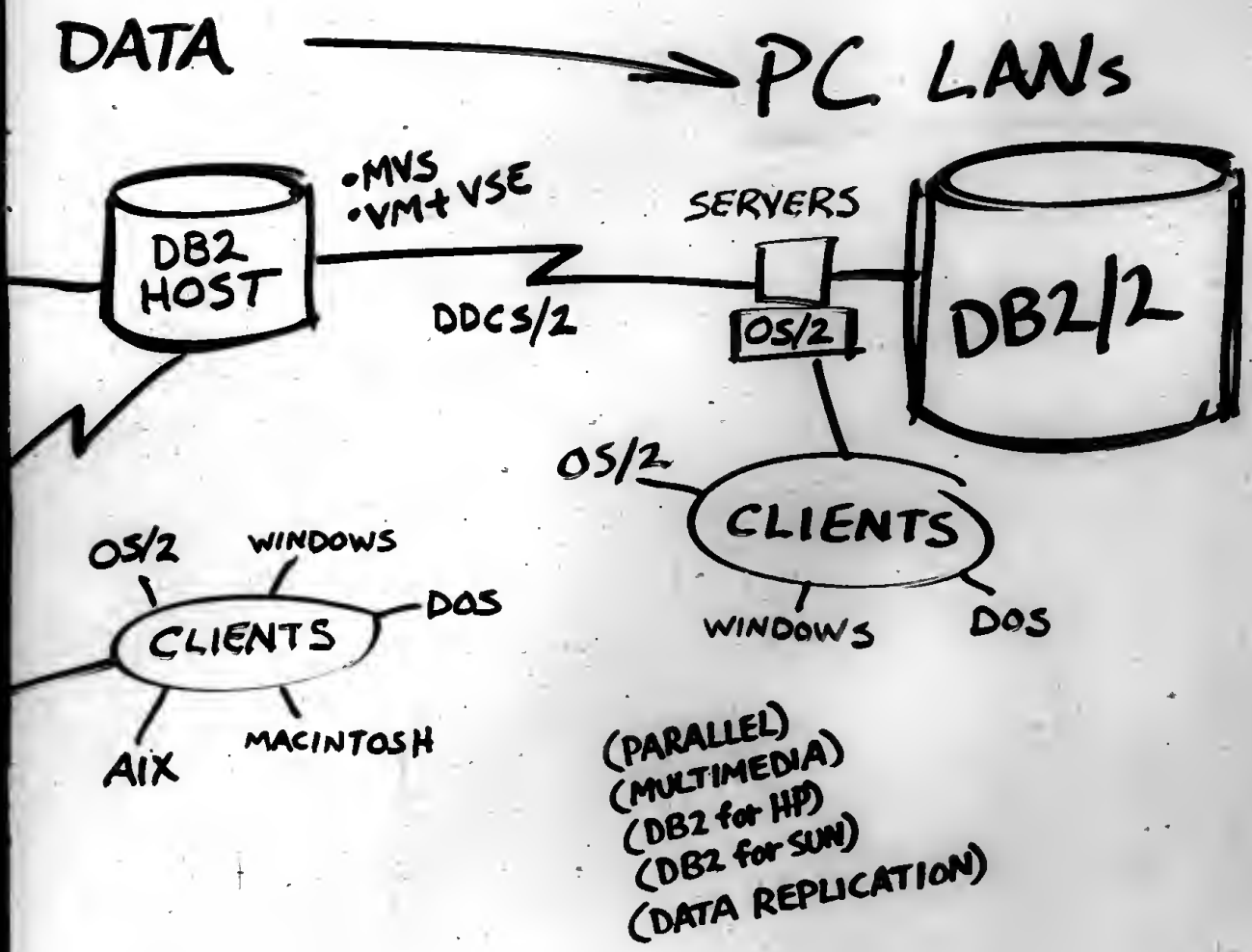
With DB2, anyw

Distributed environments offer many strategic advantages. But they can also complicate the picture when it comes to managing data safely and reliably.

That's why IBM has brought the industry-leading relational database technology of DB2® to the PC LAN and the workstation with plans to extend the line to a number of other platforms including HP™ and Sun.™ The DB2 Family and DRDA™ provide an integrated, standardized approach to distributed data and will position you to leverage emerging parallel and multimedia technologies.

DB2 family

For example, DB2/2™ and DB2/6000™ are powerful desktop databases you can trust with business data. Both support access to host data and enable you to exploit the advantages of client/server networks while leveraging exist-



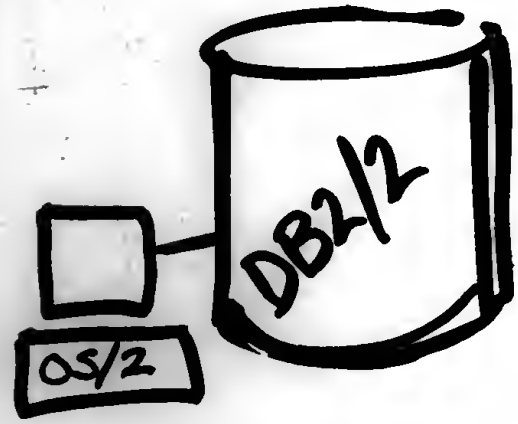
where you want.

ing database management skills. And DataHub™ offers a single point of control for catalog browsing and data replication, as well as a wide range of utilities.

And IBM can support you with every phase of the transition to distributed data because no one has more experience or brings more resources to relational database technology. For a free overview brochure, call us. In the U.S. or Canada, call 1 800 IBM-3333, ext. STAR 700. We'll be happy to draw you a more complete picture.

IBM

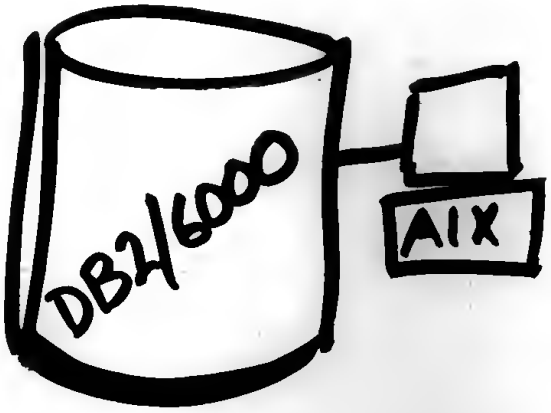
Reliable solutions for distributed data.

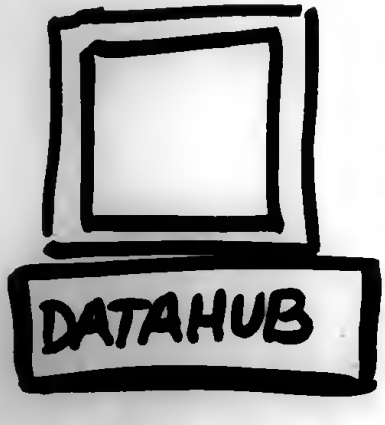


DB2/2 - Desktop data for clients and servers
- 32-bit relational database leveraging the open architecture of OS/2®
- Transaction management, concurrency control, security, integrity and recovery
- Supports DOS, Windows™ and OS/2 clients, as well as NetWare™
- Enables access to DB2, DB2/VSE and VM(SQL/DS™), as well as DB2/400 databases
- Excellent price/performance

DataGuide/2 - The information catalog
- Enables users to find shared information as objects, charts, spreadsheets, reports and queries, regardless of location
- Provides simple point-and-click operation, icons and easy-to-use GUI

DB2/6000 - Workstation server data
- 32-bit client/server engine running on AIX®
- Referential integrity, stored procedures and on-line backup ensure high performance and availability
- Enables access to DB2, DB2/VSE and VM(SQL/DS), as well as DB2/400 databases
- Supports DOS, Windows, X terminal, AIX and OS/2 clients
- Supports X/Open® XA interface specifications
- Excellent price/performance





DataHub - Distributed data management and data replication
- Central control point on OS/2 across DB2 Family
- Authorization management and remote utility initiation
- Task-oriented GUI for common look and feel
- Vendor enabled

DataPropagator™ Relational and DataPropagator NonRelational
- Cost-effective replication for the DB2 Family and IMS
- Tailor data to user needs, including history and aggregation

DataRefresher
- Makes legacy data available within relational environments
- "Drag and drop" operation simplifies data replication tasks

SOFTWARE FOR CLIENT/SERVER RDBMS

IBM®

IBM shows signs of moving toward ATM

By Suruchi Mohan

■ IBM continues its march toward Asynchronous Transfer Mode (ATM) with a slew of new and enhanced products introduced recently. Key to its effort, analysts said, is a multiprotocol router family that will natively support SNA and some LAN traffic across most routers and controllers.

Another key announcement is the ability to route network traffic over Token Ring, Ethernet and frame-relay links. Analysts agreed that while IBM cannot hope to become the market leader in multiprotocol routing, its offerings will make sense to SNA users who want to integrate LAN traffic onto their existing networks.

Analysts also said the new IBM products clearly signal a strategy shift toward ATM and TCP/IP networks.

Tom Nolle, president of CIMI Corp. in Voorhees, N.J., said this announcement marks the first time IBM has offered TCP/IP in native mode.

Another signal that IBM is moving toward ATM is that the company has grouped its routers, switches and adapter cards under the Nways multiprotocol router family, according to Glenn Gabriel Ben-Yosef, senior analyst at The Yankee Group in Boston. The idea is to foster more communication among the diverse groups within IBM and get them rolling toward a common goal, he said.

IBM's low-end 2210 Nways multiprotocol router features software from Proteon, Inc. The 2210 supports both SNA and TCP/IP in small, branch-office type establishments. It offers minimal connectivity but has a low entry point — connectivity for one Ethernet LAN and two WAN links costs about $2,000, said John Steigerwald, manager of router development at IBM in Raleigh, N.C.

In control

KEY FEATURES OF IBM'S 3746 CONTROLLERS

- Full APPN network node support, including dependent LU requestor and high-performance routing
- APPN capability independent of the network control program
- Native TCP/IP routing over Token Ring, frame relay and Escon channel
- Upgradable to stand-alone controller, independent of the 3745 and network control program

Twice as nice

IBM also offers two Nways Multiprotocol Routing Network Services software programs, with or without integrated Services Digital Network support. Both programs can handle TCP/IP, Data Link Switching, frame relay, X.25 and Point-to-Point Protocol.

Robin Layland, principal consultant at Layland Consulting in West Hartford, Conn., said although the 2210 is good, IBM faces stiff competition from other vendors. Additionally, users will need a router at the main site that interoperates with the branch-office router.

Also, at the end of the year, IBM will start shipping the stand-alone version of its 3746 controller. Instead of being merely a set of fast adapters for the 3745, it will offer support for TCP/IP routing, including Open Shortest Path First and High Performance Routing, an enhanced version of Advanced Peer-to-Peer Networking. IBM will also offer an ATM attachment to the 3746 at the end of 1995.

IBM's new multiprotocol strategy may stand the company in good stead, said Reinhard Rackow, manager of network computing services at Information Systems Management Corp., an outsourcing company in Regina, Saskatchewan.

Rackow's clients are loyal to IBM products. "So far the 6611 didn't meet the need. They are looking at how to tie SNA to non-SNA traffic," he said.

IBM, Security Dynamics join forces

IBM recently announced it is teaming with Security Dynamics, Inc. in Cambridge, Mass., to combine the "single sign-on" security in its Network Security Program (NetSP) with the strong authentication in Security Dynamic's SecurID technology.

The marriage, in the form of interoperable software expected in the first half of next year, will be especially attractive to organizations with heterogeneous, distributed environments, the companies said.

Using encryption and a special "authentication server," IBM's NetSP lets users access any enterprise server by entering just one user identification and password. It enhances security by minimizing the temptation of users with multiple passwords to write them down where others may find them, the companies said.

SecurID uses a credit card-size device that computes and displays a new password each minute. A corresponding feature on a host or network server ensures that the user card and host machine always agree on what password is valid at any moment for any user. SecurID also employs a secret personal ID number entered by the user with the password.

"I like what I'm hearing, but I'll have to see how it's configured before I can say this is a wonderful marriage," said Dwayne Johnson, vice president for information security service at First Bank System, a bank holding company in Minneapolis.

Johnson, who uses SecurID but not NetSP, said the single sign-on concept is what most users are moving toward. "But it also creates problems for the security administrator," he said. "You have one ID and one password that can suddenly unlock the world."

— Gary H. Anthes

E. Ted Prince

The latest threat to IS

IS has survived many assaults on its existence. User-driven systems, PCs, outsourcing, visual programming. The latest is now upon us from an unlikely source: on-line systems. Will IS survive this one?

Do you remember when communications was the ugly stepchild of the IS world? In those days, application developers were the social equivalent of nuclear physicists. The communications guys (there were no women in these areas) were the pariahs who did necessary but unfathomable things with hexes and patchboards. This was not an area for ambitious information technology types. The only great thing about it was that everyone left you alone because management and even the information technology directors didn't have a clue what you were doing.

That's a far cry from IS today. Its fastest growing areas are networking and communications within and outside the corporation. Now the networking types have become top dogs. After all, anyone can build an application, can't they?

In the beginning, users needed IS for networking. Setting up networks, addresses, new nodes and security were intractable problems that sent corporate power back to IS. But the users have been fighting back.

At your service

Ever tried the on-line services? They do this all for you. You can set up your own networks just by buying a modem, getting their software and paying around $10 a month. From there on they handle all your networking. Adding new users to your network is as simple as getting them to pay their $10, too.

For this fee you get unlimited E-mail to anywhere in the world as well as people in your own corporation. Communications with suppliers and customers is just as simple if they subscribe to the same service. Transferring files, documents and graphics is also part of the service. Plus you get access to incredibly powerful databases of information for corporate, research, technical and commercial purposes.

So who needs a LAN, WAN or ultimately IS? With these new services you can roll your own. But isn't there going to be a problem shifting around big files, multimedia and video without a LAN in place?

Remember cable? Within a year or so you're going to connect to your on-line service via cable rather than POTS (plain old telephone service), and you're going to have all the bandwidth you could ever need. The Baby Bells are now rushing in to provide frame relay for small companies and are finally moving ISDN into the real world. So bandwidth is not going to be a problem for the user in the future.

Doesn't this sound suspiciously like the old service bureaus of yesteryear, the ones we used at the dawn of computing when it was too expensive to buy computers ourselves? Precisely. Except that this time they're providing something, in this case networks, that are also expensive and complex to set up on your own. The more things change....

On-line services are developing into giant service bureaus, taking over not only LANs and WANs but also other IS functions, such as software downloading and uploading and providing groupware and general research and information services. These services are becoming mega-IS departments, capable of providing needs that were formerly provided by IS. On-line services are becoming the ultimate outsourcers.

So the information superhighway is becoming a lot more than a transport mechanism. In fact, it's becoming a full-service corporate support center. You supply the business, they provide IS, marketing and the like. LAN, MAN, WAN? Who cares? It's all part of the service. Leave it to the techies and get on with the business.

Will IS survive this one? I have no doubt it will, but its role will change again until the next new technology comes along that needs highly specialized knowledge (try virtual reality, in about two years time).

Prince is president of Perth Ventures, Inc., a technology deal-making, publishing and consulting firm in Hawley, Pa. He can be reached by CompuServe at 74073,1236.

Control your world from the desktop

Centralized control of your distributed computing environment is now possible. With PATROL, from BMC Software, Inc., you have automated management of your computers, resources, databases and applications. Plus, you can monitor and administer your systems from a single, graphical console.

DISTRIBUTED SYSTEMS MANAGEMENT

That means maximum administrative efficiency. Continuous availability. And the ability to move forward with your distributed strategy.

Utilizing intelligent-agent technology, PATROL continuously monitors and manages the components of the environment. Problems can be either automatically corrected or the administrator notified for manual intervention.

PATROL's automated actions come from loadable libraries of expertise that are available for popular systems. And its open architecture ensures that as your environment changes, new systems will be supported.

This is the control of distributed systems you've needed. Find out more about PATROL by calling BMC Software at 713 918-8800 or **800 278-4BMC.**

BMC® SOFTWARE

The Experience. The Technology. The Future.

BMC Software international offices are located in Australia, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain and the United Kingdom
BMC Software is a registered U.S. trademark of BMC Software, Inc.
© 1994 BMC Software, Inc. All rights reserved.

Data access tools

SAS library eases path to mainframe data

By Rosemary Cafasso

SAS Institute, Inc. recently completed its trio of data access services intended to help users make better use of mainframe data.

The final piece, Remote Library Services, gives SAS PC users direct query access to SAS mainframe data. The software was targeted for a June release but was delayed two months for fine-tuning, the company said last week.

It joins Remote Computing Services, which allows users to designate a job for processing on a remote server, and Data Transfer Services, a more basic tool that downloads SAS mainframe data to PCs.

Options for users

SAS is a veteran mainframe software company that sells a core data management product — the SAS System — that works with more than a dozen SAS analysis, query and presentation tools. In recent years, the company has branched out into the client/server world and released an executive information system as well as data analysis and management tools for Unix and Microsoft Corp.'s Windows NT servers and Windows and IBM OS/2 workstations.

The idea behind the SAS data access tools is to open up options for getting at mainframe data. The options provide more front-end functionality than terminal access or terminal emulation and are more efficient than enormous downloads of data to PCs.

Several users contacted last week said they are either deploying these tools or intend to do so because of the flexibility they expect them to provide.

"We could have given users [direct] access to the mainframe, but we aren't encouraging that because we are moving to client/server," said Harmon Jolley, a project manager in the information systems and services division at Provident Life and Accident Insurance Co.

Instead, Jolley is deploying all three SAS data access options to improve the SAS environment's overall performance. He is putting in place policies to guide users in selecting the data access option that makes the most sense for the job at hand.

Installation help

Howard Dresner, a research director at Gartner Group, Inc. in Stamford, Conn., said the data access services will help users with large mainframe installations.

"Otherwise, they'd have to physically move the files down to the PC, which involves a huge amount of networking bandwidth," Dresner said.

Remote Library Services, Dresner added, is essentially a remote presentation function that provides "the user interface on the PC and some rudiments of functionality, but the mainstay lives on the host."

For example, Remote Library Services is best for lower-volume data requests or ad hoc queries that cause minimum data transfer across the network.

Queries involving huge data sets and lots of number crunching are best left to Remote Computing Services so the job can be done at a remote site instead of a PC.

Bill Hutchison, a senior programmer analyst at Intel Corp., is another user setting up guidelines to help others take advantage of the SAS options. In Hutchison's case, he is actually creating canned queries that use Remote Library Services.

"It gives us another option so we don't have to download tables," Hutchison said.

The Data Transfer Services is useful if a customer needs to work with mainframe data at a local PC for an extended period of time.

All three services can be used with the SAS PC analysis tools and will be offered as built-in components of either SAS Connect or SAS Share, two connectivity products, at no extra cost.

IBM reworks parallel mainframe strategy

Will phase out System/390 PQS as new DB2 release ships

By Craig Stedman

While IBM's CMOS-based parallel mainframes just left the barn in April, one of those machines is already being put out to pasture.

IBM executives confirmed recently that the System/390 Parallel Query Server (PQS), a specialized engine for querying DB2 databases, will start fading from the scene after next week's introduction of Version 4 of DB2 for MVS/ESA.

The new DB2, which is scheduled to ship next spring [CW, Sept. 12], should enable most query functions to be done on the more general-purpose Parallel Transaction Server (PTS). As a result, the slow-selling PQS will be "converged" into the transaction machine, said William Reedy, director of mainframe product marketing and merchandising at IBM.

"Over time, the distinction [between the two systems] will become blurred," Reedy said. IBM will not pull PQS from the market, nor will it abandon the small number of customers who have installed the query machine. But it will try to "push them down this path" toward the PTS, he added.

The transition path will not be a well-traveled one, according to analysts. Charlie Burns, research director for large computer strategies at Gartner Group, Inc. in Stamford, Conn., said IBM has shipped well under 25 PQS systems to date because of a variety of drawbacks (see chart).

No thrills here

Several mainframe users said last week that they were underwhelmed by their first look at PQS, largely because of the need to stop all querying while the databases on the machine are updated from a host ES/9000 system.

General Accident Insurance of America is in the early stages of planning a data warehousing project, but PQS "didn't thrill me a whole lot," said John Elcock, assistant vice president of computer resource management at the Philadelphia-based company.

"It was kind of surprising that IBM would come up with a system that had to be attached to another computer," Elcock said. "I thought they might have come up with a more elegant system." The specialized nature of PQS also worked against it, he added.

"This machine could only be used for one thing, and if that one thing doesn't work, you just have to get rid of the system," Elcock pointed out. By contrast, a multipurpose PTS offering "would certainly be more appealing," he said.

Doug Underhill, a technical specialist at CSX Technology, Inc., the information systems subsidiary of CSX Corp. in Jacksonville, Fla., agreed that PQS is limited to "some subsets of functionality" that are too narrow to justify the "not very attractive price" IBM has been charging. "The economics did not make for a real good business case," Underhill said.

Planned enhancements

In April, IBM said it planned to develop a stand-alone version of the 48-processor PQS that could attach directly to SNA and TCP/IP networks [CW, April 11]. But that is no longer in the blueprint, Reedy said. He acknowledged that the number of PQS systems shipped to date "is not a ton of systems."

IBM does plan to add database updating capabilities to PQS, and full convergence with the PTS system could take a couple years to complete, depending on DB2 development schedules, according to Reedy. But Burns and other analysts said they

PQS, *page 70*

WARE data HOUSE

Amdahl system rates higher

Amdahl Corp. also introduced a parallel query system earlier this year based on NCube's hardware and Oracle Corp.'s database. That machine "has less of a strike against it" than IBM's PQS because of its Unix/Oracle nature, "but it still more or less addresses the same small market," said analyst Bob Djurdjevic, president of Annex Research in Phoenix.

Query quashers

Shortcomings that limited demand for IBM's PQS include the following:

- **Based on MVS and DB2.** Most new decision-support applications are being put on Unix systems, according to analysts.
- **High cost.** PQS selling prices are typically more than $1 million, IBM acknowledged.
- **Not a stand-alone system.** The first PQS implementation requires an Escon-capable ES/9000 mainframe as a host.
- **No data update capabilities.** Data must be updated by the host mainframe, forcing all queries to be stopped.

Sports Illustrated powers up Mac

By Mark Halper

Editors and writers at *Sports Illustrated* will soon be spinning their yarns about Andre Agassi, Joe Montana and other sports figures on Power Macintosh computers. That's because of an information systems decision to leave behind a corporate Digital Equipment Corp.-based publishing system in favor of departmental technology.

Harry Wilson, the magazine's network administrator, said he is bidding adieu to Atex Publishing Systems text editing software running on a Digital PDP 11 because in a magazine world increasingly driven by graphics, design and layout, the Digital/Atex system is simply too limited.

"It demonstrates line endings, but it doesn't show you the actual final line break, and it won't show you what the article actually looks like on a page," Wilson said. That lack of refinement has become unacceptable in a competitive production environment where typography plays an integral role, he noted.

Sports Illustrated hopes to have a Power Macintosh network in place for its 100 writers and editors within two months and to bring it live on a section-by-section basis in the spring.

Keeping up with the Times

The magazine is following the lead of *Time*, *Money* and other Time, Inc. publications that have already switched from the central Digital/Atex system to decentralized Macintosh networks. Eventually, all of the company's magazines will be on Macintosh computers, according to Dennis Chesnel, director of editorial development at Time.

The absence of a WYSIWYG quality costs *Sports Illustrated*'s editorial staff of 100 editors and writers hours each week in aggravating rewriting and redesigning exercises, Wilson said. The magazine is choosing between two editorial programs, one from Quark, Inc. and another from Scitex America Corp.'s P. ink, that provide editors with an accurate view of their story layouts.

"The writers will be able to work in a word processor but get feedback on how their story fits in the layout," Chesnel said. "That's an important feature for us."

Macintoshes are popular at Time because of the superiority of graphics and text programs compared with Windows, Wilson said.

But technology alone did not influence Wilson's decision at *Sports Illustrated*. Corporate IS economics, if not politics, also encouraged the move. According to Wilson, Time has mandated that all publications move off Atex by 1995.

Chesnel said that was not quite true. Rather, he noted, each time a Time publication leaves Atex, the remaining publications pick up some of the costs that that publication had been contributing to maintaining the Atex system.

The cost of maintenance did indeed play a role in *Sports Illustrated*'s decision.

The old Atex system is "costing us somewhere close to a million dollars a year to maintain," Wilson said. "We should be able to do a little bit better than that."

Training investment

One cost Wilson should not contain too severely, cautioned Bonnie Rogers, news systems manager at the *Dallas Morning News*, is the cost of training editors on the new system.

"If you skimp on that, people end up getting frustrated and not using the software the way they're supposed to," said Rogers, who oversaw the *Morning News*' move off a DEC PDP 11/84 to a Tandem Computers, Inc. system from Systems Integrators, Inc. last year [CW, Feb. 1, 1993].

During its transition, the *Dallas Morning News* sent editors to five full days of training and sent reporters to two full days, she said.

That message was not lost on Wilson, who noted that *Sports Illustrated* is still working out training and support details.

"We're going to have to determine how we'll provide support to the same level that it is provided by an outside department now," Wilson said. Currently, Time provides round-the-clock support. If *Sports Illustrated* is to meet that level, it would have to consider adding people and developing flextime work schedules, he said.

Staffing changes

Chesnel noted that each Time publication is adding between one and six workers for editorial systems support, depending on the size of the publication.

Support, he acknowledged, is a questionable cost variable. "It's very difficult to say how it will all shake out because while operating costs are lower in the workstation environment, we're also adding technical staffs within each division," Chesnel said.

A central Time staff will continue to provide terminal repair functions while the individual magazine staffs handle application and workflow issues, he said.

So how are *Sports Illustrated*'s editors feeling about the upcoming switch from their dumb Atex terminals to their graphical user interface-slick Apple Computer, Inc. computers? According to Wilson, "It's been pretty much a mixed reaction; some are saying 'It's about time,' but some are pretty set in their ways."

System tryouts

Harry Wilson, *Sports Illustrated*'s network administrator, estimated it will cost "about a quarter of a million" dollars for roughly 100 end-user Power Macintosh 7100s and 8100s. File servers and a network will cost a comparable amount, and text software will cost about $200,000, he said.

Wilson said his server selection will probably be determined by the text software chosen: P. Ink runs on Unix, while Quark runs on Novell, Inc.'s NetWare or on Unix if Apple protocols are installed. He is not considering Microsoft Corp.'s Windows NT, although that operating system could become a factor over time, he said.

The network will include a Unix network management program from Cabletron Systems, Inc., Wilson said. Dennis Chesnel, director of editorial development at Time, said databases will eventually be connected across Time's magazines for archive sharing.

—*Mark Halper*

Help/Systems, Inc. has announced Auto Tune 5.0, automatic performance tuning software for the AS/400.

According to the Minnetonka, Minn., company, Auto Tune 5.0 adds tuning for interactive jobs and the machine pool. An interactive job is converted to a batch job only for the duration of the batch work.

Users can adjust two different sets of performance factors for day and night environments. A client Windows interface lets users display color graphs of performance history statistics.

Prices range from $2,450 to $7,800.

▶ *Help/Systems*
(612) 933-0609

Software AG of North America, Inc. has announced the Unix Productivity Pack, a Unix development environment on CD-ROM.

According to the Reston, Va., company, the Unix Productivity Pack reduces the time and effort involved in writing Unix-based applications.

The CD-ROM includes the following Software AG applications: Adabas, a relational database management system; Natural, a fourth-generation language; Entire Net-Work network middleware; Natural Construct, an application generator; and Predict, a data dictionary and operational repository.

A second CD-ROM includes complete product documentation and three manuals. An automatic installation feature is included.

Prices for the Unix Productivity Pack range from $30,000 to $120,000, depending on the number of users.

▶ *Software AG*
(703) 860-5050

UniSolutions Associates has announced Bart, a backup, restore and tape management system.

According to the Redondo Beach, Calif., company, Bart lets users schedule networkwide file system backups, track backup tapes and schedule file restores with an on-line tape database.

The product provides automated access to any proprietary backup method and has an internal scheduler to perform backups automatically after scheduling parameters are set by the user.

The contents of each backup are recorded in a tape library database and a report database of scheduled backups. Users can initiate restores by highlighting files from an on-line log, which the administrator then queues for approval.

Prices start at $1,495.

▶ *UniSolutions*
(310) 370-4024

PQS

CONTINUED FROM PAGE 69

expect PQS shipments to stay at the trickle level at best.

Bob Djurdjevic, president of Annex Research in Phoenix, said the query server was originally expected to ship last year as a "stopgap measure" before PTS became available. But development was delayed and the two machines were released at the same time, making PQS "a solution looking for a problem," he said.

PQS sales forecasts were never very high because database querying remains a relatively small market dominated by the Teradata unit of AT&T Global Information Solutions, Djurdjevic added. "It's not a natural type of a market," he said. Even Teradata "is not a household name in the industry."

everything IS NEW.
nothing IS THE WAY it WAS.
it's the wake-UP CALL for a NEW way of WORKING.
TIME TO rise and shine.

INTRODUCING 1-2-3 RELEASE 5. NOW THE LEGENDARY SPREADSHEET BRINGS MORE PEOPLE TO THE NUMBERS AND THE NUMBERS TO LIFE.

1-2-3® has always helped individuals become more productive. Now it goes to a new realm—workgroup productivity. With strengthened ties to Lotus Notes® and new, sophisticated routing features, workgroups are using 1-2-3 Release 5 to make decisions, reach consensus and explore possibilities.

No other spreadsheet has the features of 1-2-3 Release 5. Features that make everyday spreadsheet tasks easier. Features that help you move from task to task fluidly. Maximum productivity, minimum effort.

TAP THE POWER OF NOTES WHEN YOU'RE IN 1-2-3. TAP THE POWER OF 1-2-3 WHEN YOU'RE IN NOTES.

Say you're working on the annual budget in 1-2-3. You can save your spreadsheet in Notes. Then share ideas and information with colleagues working on the same budget at the same time.

Lotus NOTES READY

Any changes to your spreadsheet are automatically synchronized and distributed thanks to Notes replication technology. Plus Notes' security protects the integrity of your data.

When you're working in Notes and want to crunch numbers, prepare budgets or perform "what-if" analyses, you can launch into 1-2-3 with Notes/FX™ 1.1—to get the power of 1-2-3 right in your Notes application.

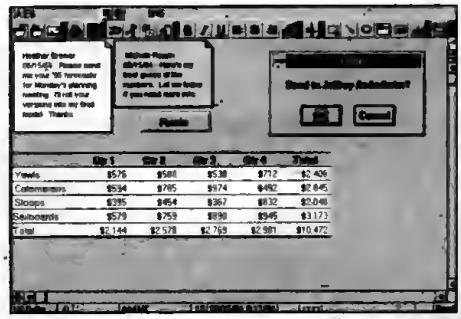
Notes/FX goes beyond OLE to provide you with a dynamic two-way exchange of key information between Notes and

freedom of MOVEMENT, NOT chains of COMMAND.

1-2-3. So you can roll that 1-2-3 information back into any Notes application.

POWERFUL WORKGROUP FEATURES EVEN WITHOUT NOTES.

1-2-3's powerful Version Manager™ lets each person in your workgroup save multiple sets of charts to any name range. So you know the who, what, when and why of every change all the time.



1-2-3's Range Routing lets you share data with colleagues—sequentially or all at once—collecting their comments and input into a single document.

Plus, unlike other spreadsheets, 1-2-3 can designate particular ranges for comment or review by particular users, rather than routing the entire worksheet. Range Routing lets you mail the spreadsheet range to workgroup members for input, track progress, then roll everyone's ideas back into your file, complete with comments and changes tracked as versions.

1-2-3 Release 5 worksheets and ranges can be routed using either VIM or MAPI based e-mail and can be routed either serially or in parallel.

1-2-3 Release 5 features Lotus Maps. It's the easiest, most effective way to analyze your spreadsheet data geographically.

MAXIMUM PRODUCTIVITY, MINIMUM EFFORT.

1-2-3 Release 5 is packed with innovative new features designed to help you get more done with less effort.

SmartMasters™ are predesigned and customizable templates of everyday business forms—like expense reports, invoices and purchase orders—with built-in intelligence to guide you through common tasks in record time. Or create custom SmartMasters for yourself or your workgroup.

With Lotus Maps you can create instant maps of geographic data. Select a range of data and watch 1-2-3 Release 5 create the appropriate map with color-coding based on data ranges. 1-2-3 Release 5 ships with maps for the world by country, U.S. by state, Canada by province, Europe, Mexico, Japan, Taiwan and Australia.

1-2-3 Release 5 features seamless integration with Lotus Approach® database to easily create data entry forms and generate reports and mailing labels.

With Fast Format you can apply the formatting you've designed for one range to any other range in the worksheet — with one click of the mouse.

One-Step Charting lets you build a chart complete with labels, titles and legends, all in a single step.

Drag-and-Fill fills in ranges from other documents in just one step. And our improved OLE 2.0 Drag-and-Drop lets you move copy or data across worksheets or files fast.

Multi-page Print Preview lets you view up to nine spreadsheets on your screen before you print.

Taken all together, the new 1-2-3 is loaded with enhancements that make getting the job done a whole lot easier—alone or in a workgroup. And 1-2-3 Release 5 gives you the best compatibility with 1-2-3 for DOS of any spreadsheet. To learn more about 1-2-3 Release 5, visit your Lotus Authorized Reseller or call **1-800-TRADE-UP, ext. A151** * for a free demo disk. A 1-2-3 upgrade costs $119.**

Lotus
Working Together

NEW SMARTSUITE 3.0. A MAJOR RELEASE TO HELP YOU AND YOUR TEAM WORK TOGETHER.

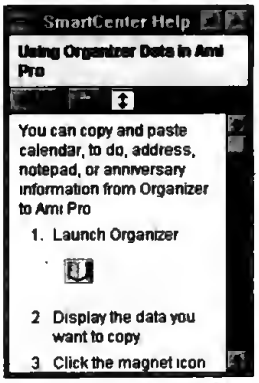
To work better people need powerful desktop applications, built for both individual and team productivity. SmartSuite® 3.0 is exactly that. It's the best suite for this new way of working because it's the only suite built to optimize Lotus Notes.

The applications that make up SmartSuite have been upgraded in some very important ways—so they work harder and work together better than ever.

1-2-3 Release 5 is packed with new features like SmartMasters spreadsheets templates, Lotus Maps for geographic visuals of data, Smart Assistants to guide you, seamless integration with Approach database, Range Routing for mailing spreadsheet ranges, OLE 2.0 Drag-and-Drop, and, of course, Lotus Notes Integration.

The new Lotus Approach 3.0 offers unprecedented ease-of-use, PowerClick™ reporting, X10™ technology (our new, exclusive, speed-optimized architecture) and the easiest-to-design forms, mailing labels and crosstabs on the market.

Ami Pro® 3.1 offers powerfully fast word processing (49% faster than Word, 103% faster than WordPerfect®†), low memory/hard disk requirements (4MB RAM, 15MB for complete installation), with proofing tools, collapsible click-and-drag outlining, revision marking, powerful macro language and automatic list renumbering. There are over 55 predesigned style sheets for memos, faxes, reports and more. Built-in charting & in-context drawing tools. Ami Pro also seamlessly imports documents from other word processors.



Help Card, one of SmartSuite's powerful help tools, guides you through cross-application tasks.

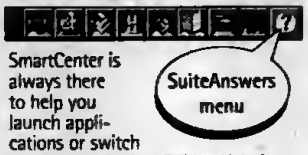
Freelance Graphics® 2.1 features task and industry specific SmartMasters, a unique 3-step process to create presentations, charting and drawing, presentation management and improved import/export capabilities.

And Organizer™ 1.1 offers easy linking for cross-referencing, flexible printing, group scheduling and nifty integration with Ami Pro so you can create monthly calendars in Ami Pro from Organizer appointments.

SMARTSUITE 3.0 IS A BETTER INTEGRATED SUITE ACROSS THE BOARD.

The integration in SmartSuite begins with a consistent look and feel across applications—they share a common user interface, menus, SmartIcons® and a Live Status Bar.

SmartCenter, the headquarters for cross-application services, is always there to help you switch or launch applications. You can customize its icon palette into the configuration that's most convenient for you.



SmartCenter is always there to help you launch applications or switch between them. And Bubble Help is right there for you—all you do is point.

SuiteAnswers are cross-application help tools which include a SmartSuite Guided Tour and task-oriented Help Cards—plus the new ScreenCam™ for creating audio/visual "screen movies." It's the only help service in Windows™ that stays up as you move between applications.

Smart Assistants are your step-by-step guide through common tasks.

And our powerful 1-2-3/Approach database integration lets you analyze and

format 1-2-3 data, taking full advantage of Approach's easy-to-use forms and reports, dynamic crosstabs to pivot rows and columns and tools for creating summaries or viewing data in several formats.

SMARTSUITE, THE NOTESREADY SUITE, EXTENDS THE DESKTOP TO THE WORKGROUP.

SmartSuite 3.0 includes powerful workgroup enhancements. But for an even higher level of workgroup capability, just add Lotus Notes and see what happens:

Combined with Lotus Notes, 1-2-3 Release 5 becomes a model management system that lets team members search a library of worksheets.

Add Notes to Ami Pro 3.1 and it becomes a real "workgroup processor." Use the built-in Notes database for efficient, secure document sharing and tracking. And you can format your Notes or cc:Mail® messages directly in Ami Pro.

Approach 3.0, the top-rated Windows database, becomes a shared reporting, forms and analysis tool. Its advanced integration with Lotus Notes lets you build sophisticated, information-intensive workgroup applications and join Notes data to other types of databases, from dBASE to SQL.

And Freelance Graphics 2.1, used with Notes, becomes a presentation storage system, a library of past presentations, which a team can browse and pull from to create new ones.

For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. A152*** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

Lotus NOTES READY

the COMMITTEE IS dead. long live the TEAM.

Lotus

SMARTSUITE 3.0

SmartCenter
(to move between applications)

SmartMasters
(for predesigned templates)

Fast Format
(apply styles throughout documents)

ScreenCam
(to put your ideas in motion)

Smart Assistants
(to guide you)

Configurable Single Install
(for easy one-step installation)

Small Footprint On Your PC
(the most efficient suite available)

1-2-3/Approach Integration
(database power in your spreadsheet)

Lotus NOTES READY

1-2-3 RELEASE 5 SPREADSHEET

SmartMasters
(useful predesigned templates)

Lotus Maps
(geographic visuals of data)

Lotus Approach Integration
(for extra database power)

Smart Assistants
(to guide you)

Range Routing
(for mailing spreadsheet ranges)

Direct Access To Database Files
(open dBASE and Paradox® files directly into 1-2-3)

OLE 2.0 Drag-And-Drop
(move or copy data, with visual mouse cues)

APPROACH 3.0 DATABASE

PowerClick Reportwriter
(for wysiwyg design)

Smart Assistants
(to guide you)

InfoBox
(instant on-screen manipulation)

X10 Speed Architecture
(for blazing speed)

Lotus 1-2-3 Integration
(for working with 1-2-3)

PowerKey™ Technology
(for direct access to existing data)

Dynamic Crosstabs
(for drag-and-drop analysis)

AMI PRO 3.1 WORD PROCESSOR

New Proofing Tools
(for easy document proofing)

Collapsible Click-And-Drag Outlining
(simplifies organization)

Revision Marking
(edit documents without confusion)

New Style Sheets
(more professionally designed templates than ever)

Text Styling
(make your e-mail look better)

WordPerfect Switchkit®
(the move from DOS is painless)

Stick-It Notes
(add comments and messages)

FREELANCE GRAPHICS 2.1 PRESENTATION GRAPHICS

Unique Three-Step Process
(for quick and easy presentations)

One-Click Charting
(access a library of charts and drawings with one click)

Page Sorter
(presentation management at a glance—review and rearrange with ease)

Import/Export
(more file formats than ever—including Harvard/DOS and PowerPoint® 3.0)

ORGANIZER 1.1 PERSONAL INFORMATION MANAGER

Easy Linking
(makes cross-referencing simple)

Flexible Printing
(for your manual planner, mailing labels from your address book)

Group Scheduling
(use with cc:Mail to set up meetings with anyone on your WAN or LAN)

Real Time Access
(instantly view co-workers' busy and free time)

how the NEW SMARTSUITE 3.0 HELPS workgroups work.

The new SmartSuite 3.0. Featuring major new releases of 1-2-3, Ami Pro, Approach database and Freelance Graphics—plus the popular and powerful personal information manager Organizer—this is the ultimate integration of your most important desktop tools. For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. A152*** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

Lotus
Working Together

*In Canada call 1-800-GO-LOTUS. **$119 suggested retail upgrade price. †NSTL, May 1994. ††$299 promotional price available while supplies last. ©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Lotus Notes, 1-2-3, Approach, Ami Pro, cc:Mail, Freelance Graphics, SmartSuite, SmartIcons and Working Together are registered trademarks and ScreenCam, PowerClick, Notes/FX, Version Manager, SmartMasters, Organizer, PowerKey, X10 and NotesReady are trademarks of Lotus Development Corporation. WordPerfect and Switchkit are registered trademarks of WordPerfect Corporation. PowerPoint is a registered trademark and Windows is a trademark of Microsoft Corporation. Paradox is a registered trademark of Borland International, Inc.

Hospital office now 90% paperless

By Mitch Betts

Sometimes the health care industry seems like mostly a paperwork business that offers medical care on the side.

But the Washoe Medical Center in Reno, Nev., is fighting the paper tide with an information system that has cleared the aisles of file cabinets and produced a hospital business office that is now almost 90% paperless.

"Other industries may be ahead of us, but for health care that is a major change," said Jim Hauenstein, chief information officer at the 528-bed hospital.

Jim Hauenstein: *The hospital saw 'immediate benefits from the system*

"We were running out of space for filing cabinets, which were shoved into every corner possible," he noted. The benefits have shown up particularly in customer service.

Part of the solution has been the industry trend toward electronic data interchange for insurance claims. Another key element is an imaging system that scans paper so it can be easily located and used by customer service representatives to answer billing questions.

The imaging system involves a Digital Equipment Corp. 4300 minicomputer and a Cygnet Systems, Inc. optical disc jukebox. Software and systems integration were handled by Shared Medical Systems Corp. in Malvern, Pa.

Equally important is the client end of the system, where PCs run OS/2. Because of OS/2's multitasking capability, customer service representatives can see a document from the imaging system in one window and simultaneously extract data from the hospital's IBM ES/9000 mainframe.

"The benefits were immediate," Hauenstein said. "Patients' billing inquiries are now answered quickly. Callers no longer are put on hold or told they will be called back while clerks search the records stacks."

Moreover, the electronic environment provides faster turnaround of reimbursement claims, he said, thus improving the hospital's cash flow.

While the business office is nearly paperless — there will always be some paper correspondence — the clinical side of the house is just 25% paperless, Hauenstein estimated. That is largely because doctors still prefer to keep their patient notes on a paper medical chart.

But the Washoe hospital is making some progress on electronic medical records. For example, an OS/2-based application from Quantitative Medicine, Inc. in Annapolis, Md., allows 70 nurses in the intensive care unit to record and access data from a patient's bedside.

"Yesterday's technology makes for today's corporate rust."

The implications get more severe.

The continuing explosion in information technologies is providing unprecedented opportunities for products, services and vendors.

The competition knows it.

Being informed gives the winning edge to the company manager who knows the results that emerging technologies can produce.

For that reason CW Custom Publications created The White Paper Program, The Computerworld Solutions Series, and multi-sponsored supplements offering inside information on emerging technologies. We work with giants like Motorola, IBM, Apple, OSF, SunSoft, Oracle, UniForum, AIIM, Price Waterhouse, OMG and many others.

Watch for CW Custom Publications–produced for the corporate leader who understands the need for timely use of emerging technologies.

Custom COMPUTERWORLD Publications.

FOR MORE INFORMATION, CONTACT CAROLYN NOVACK, PUBLISHING SERVICES DIRECTOR, CW CUSTOM PUBLICATIONS, BOSTON 1-800-343-6474

©1993 Computerworld Custom Publications

REALITY BYTES™

REALITY

INQUIRING MINDS WANT TO KNOW ABOUT PROCESS MANAGEMENT.

Why? Because Process Engineer—the enterprise-wide, automated, process management software from LBMS—puts you where you should be. In control.

As a project manager responsible for developing Client/Server applications, you will appreciate the fact that Process Engineer delivers a battle-proven, state-of-the-art development process. A process specifically created to harness the power of Client/Server systems. It incorporates a spiral architecture to combine iterative and incremental development.

Say good-bye to inflexible mainframe methodologies, because Process Engineer's real strength is its versatility. Whether you decide to use industry-standard processes, corporate best practices or a powertool-specific method, Process Engineer will handle them all. You can even combine them or build your own.

And there's more. Take the drag-and-drop project management attributes for example. They will help you create project plans on the fly, estimate effort and generate schedules, making *your* job a lot easier.

Now your developers can be more effective, too. Process Engineer can guide them through their tasks using the automated on-line *HyperGuide*. Task details, technique examples and deliverable samples are all part of the package.

And for your CIO, the best part is the LBMS *Process Library*—a facility which enables you to capture and reuse your experience time and again.

Now that *must* be good news! *That's why!*

LBMS also offers Systems Engineer—the Client/Server CASE tool for serious enterprise-wide application development. Inquire *now*! Call **1-800-345-LBMS** for full information about the outstanding capabilities of Process Engineer.

LBMS

For more information on Process Engineer, fax this to (713) 623-4955.

Name

Company/Title

Address

Phone/Fax # CW

Reality Bytes is a trademark of LBMS, Inc. ©1994 LBMS, Inc. All rights reserved.

Sybase shoots for more customized support plan

By Kim S. Nash

Sybase, Inc. wiped out its old-fashioned, one-size-fits-all support program last week in favor of a four-pronged offering intended to give SQL Server database users service options that can be better tailored to individuals' needs.

Thn changes, whicb come under the banner of SupportPlus, are innovative among relational database makers, bnt the rose bas thorns, observers said. Some users stand to save mooey, but others are likely to see a 5% to 8% increase in support fees, according to Bob Johnson, an analyst at Dataquest, Inc. in Framingham, Mass.

Sybase's four new service tiers — Desktop, Standard, Advantage and Preferred — provide technical help and personalized attention not previously available, Johnson added. Still, "the challenge to Sybase will be to quantify tbe value received ... to jnstify the increased expense," be said.

Service options

More than 70% of Sybase users are likely to subscribe to Standard support, with 5% to 10% going for the top-of-the-line Preferred service, Sybase estimated.

Support makeover

Sybase and other database firms are trying to remold support programs to mirror the way customers use the products — individually, in workgroups or enterprisewide. Rival Oracle Corp. also reworked its technical snpport programs recently, aiming to give giant global companies such as AT&T Corp. and Timex Corp., two large Oracln customers, more unified support contracts worldwide [CW, June 6].

"We saw a demand from customers for less of a blanket approach," said Tim Artl, Sybase's director of marketing for wortdwide customer service and support.

Overall, Sybase's SupportPlus is good news for small sites but could be bad news, in the form of higher fees, at larger installations.

For example, Sybase's new Desktop option targets small sites running SQL Server on Novell, Inc.'s NetWare, Microsoft Corp.'s Windows NT or otber low-end operating systems. Because Desktop subscribers are likely to run small, simple applications — or even just test Sybase products — service kicks to only during local business bours, and just one person at the site is authorized to call tbe vendor for belp.

Under the old plan, small customers had no choice but to buy the same full maintenance and $7,500-per-call phone support that the biggest Sybase users had to buy.

Meanwhile, to large SQL Server customers used to paying a relatively tow price for maintenance (7.5% of tbeir non-discounted database license fees), SupportPlus may seem expensive. On the face of it, 7.5% looks better than new prices, which range from 16% to 30% of non-discounted license fees, said a Sybase user at a large New York financial firm. "They would do well to show me just what improvements I can expect for my money," he warned.

Then and now

Sybase's new service options could save some users money over previous one-size-fits-all support programs

Old plan	Percent of database license fee/price
Database maintenance, including software updates and bug fixes	7.5%
Phone support, including emergency calls during business hours only	$7,500 per contact, up to $25,000 for four contacts in 24 hours

New plan	Percent of database license fee/price
Desktop, including 7 a.m. to 5:30 p.m. support and access to CompuServe	30%*
Standard, including CD-ROM documentation and white papers	16%
Advantage, including 24-hour, seven-day service	18%
Preferred, including dedicated technician, unlimited user calls	22%

*Plus $1,000 per year

Dedication pays off

Indeed, Sybase's top-tier Preferred plan now offers dedicated technicians to work with a limited nnmber of users, either on-site or from one of the vendor's 14 support offices worldwide. Other draws include free CD-ROM documentatioo and tho ability to set up identical support structures at all sites associated with global users. Previously, service options varied from country to country.

"Sybase needed to catch up" to Oracle and Informix in the area of support, and SupportPlus "will allow Sybase to be more competitive," said Kurt Johnson, an analyst at market research firm International Data Corp. in Framingham, Mass.

Solid but flexible support can often sway database buying decisions, especially in tricky mainframe downsizing projects, users and analysts said. Transamerica Commercial Finance Corp., for example, recently chose tnformix Software, Inc. over Oracle for a 32G-byte decision-snpport application because "I felt more comfortable that [Informix] could give us the attention we wanted," said Carole Hershman, chief toformation officer at the Chicago-based financial firm.

Boeing set to fly with client/server-based manufacturing

By Ellis Booker

Boeing Commercial Airline Group has announced a major commitment to client/server-based manufacturing, joining the likes of aerospace giants Hughes Aircraft Co. and Northrop Grumman Corp.

Based in Renton, Wash., the commercial airline group is The Boeing Co.'s largest operating unit, with 75,000 employees. At the end of August, it announced a $20 million software licensing deal for the Triton family of manufacturing and chain management applications from Baan USA, Inc. in Reston, Va.

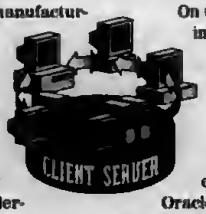
Keeping it quiet

Details of the deployment are being closely guarded by Boeing, which prefers to talk about contracts in the context of the process re-engineering and systems upgrades it has undertaken over a number of years. Boeing began modernizing its equipment base several years ago, said Douglas Frederick, director of tnformation systems support for the business process redesign effort at the company.

"We are confident that Baan's software will help give ns additonal capability and control that we need to build our airplanes, as well as give us the flexibility to make continuous improvements to many of our production processes," said Tom Schick, a vice president in the commnrcial airline group.

Indnstry analysts were quick to note the significance of the Boeing plan, which could scale to 15 of Boeing's 20 U.S. plants and 80 to 100 departments, they said.

Bruce Richardson, an analyst at Advanced Mannfacturing Research, Inc. in Cambridge, Mass., said the Boeing/Baan deal could be the largest ever for manufacturing software.



Bruce Johnson, president of Baan USA, agreed. "We believe this could be the largest client/server production system in the world," he said, adding that he has witnessed a turnaround among commercial aerospace companies about the appropriateness of off-the-shelf software for their core systems. Specifically, they are surrendertog the belief that their business is anique and thus demands custom software applications.

Richardson said commercial airline makers have been slow to move to client/server architectures. The exception was Nortbrop [CW, Aug. 15], which picked a system based on Oracle Corp.'s database earlier this year, primarily to carve $16 million a year from operational costs.

Calculating additional expenditures in hardware, networking and consulting related to the deployment, Richardson projected the Boeing project would come in at $50 million to $100 million.

But Boeing's Frederick disputed those figures and stuck with bis original estimate. "Our estimate is $20 million," be said.

On the other band, Boeing has publicly stated in the past that its five-year technology investment plan aims to reduce the time it takes to produce a plane by one-third to a half — from under 12 months to six to eight months — as well as reduce its overall costs more than 25%.

Baan USA won the nod after a six-month evaluation that narrowed the field to Baan, Oracle and SAP America, Inc. Oracle will provide the database for tbe system. The choice of Baan is significant, observers said. The privately held company, which bad revenue of $105 million worldwide last year, is a distant third behind client/server mannfacturing software leaders SAP and Oracle.

The first Boeing plant will be brought on-line with the Baan system in tbe beginning of next year.

Client/server tools hit some snags in the UK

By Clare Haney

Some customers in the UK are having problems with their development tools.

Oil giant Amerada Hess, for one, said it has had performance problems with an offshore application based on Oracle Corp.'s Cooperative Development Environment collection of client/server tools.

And earlier this year, Lars Lindstedt, senior systems designer at the European Bank for Reconstruction & Development, lashed out at Powersoft Corp.'s PowerBuilder tool for its allegedly poor scalability. Lindstedt said that while the bank remains firmly committed to the concept of client/server computing, he has doubts about the abilities of existing client/server tools.

False claims

"Many tool vendors are making significant claims about what their products can do," Lindstedt said. "My feeling is that not many people have built larger-scale systems with these Windows-based client/server tools. PowerBuilder is not the only tool there are issues with."

According to Ed Acly, director of software research at market analyst International Data Corp. in Framingham, Mass., performance problems arise because vendors are making the same cure-all claims for client/server technology that they made for computer-aided software engineering in the 1980s. And users seem ready to fall for the hype a second time around.

"Users are once again being sold on the 'silver bullet' option," Acly said. "But there is no easy way.

"Now is not the time to make quick decisions or proceed without thorough research. Too many people are making long-term decisions based on a little technology. Users need to back off and look beyond tomorrow," he said.

He welcomes the fact that users are realizing the limitations of some low-end tools. "It means problems are being addressed earlier before users have committed too much. They have the chance to do some damage control," Acly said.

Troubles abound

The European Bank had no performance difficulties with an invoice management application based on simple data structures written in PowerBuilder. Problems arose, however, when the bank spent 300 months of labor building an application for highly complex data tracking of investment projects.

Lindstedt said the application is now in production, adding, "We are still addressing some issues in terms of the extent to which it performs. It hasn't been painless, but we got there. We're now striving to make the process smoother for the future."

We want proof

Acly said he sympathizes with users. "The trouble with little client/server tools is that they are locked into a particular technology. You can't redeploy or tune them. You have to rewrite them and totally change the design."

Acly recommended that users press vendors to show them sites that have used their tools to build applications that are comparable to their own expectations.

Robin Bloor, chief executive officer of UK consultancy ButlerBloor, agreed. "You wouldn't buy a car that you later discover can only go at 50 miles an hour. If you can't go and see such a system, you know that you're playing in a different league. You're now in an area of software risk."

Haney writes for *Computing*, an IDG publication in the UK.

Liant Software Corp. has announced Open PL/I 6.0, a PL/I development tool set for Unix.

According to the Framingham, Mass., firm, Open PL/I 6.0 includes support for on-line transaction processing, VSAM, graphical user interface tools and Digital Equipment Corp. VAX/VMS extensions.

The product supports interlanguage calling, letting developers integrate tools into applications using standard calling conventions.

Open PL/I 6.0 is made up of PL/I Compiler, PL/I Macro Preprocessor and CodeWatch, a source-level debugger.

Open PL/I 6.0 costs $20,000 for an eight-user system.

▶ *Liant Software*
(508) 872-8700

XVT Software, Inc. has announced XVT Development Solution for C++ 3.0, object-oriented, cross-platform development software.

According to the Boulder, Colo., firm, XVT Development Solution for C++ 3.0 includes XVT-Architect, new features in the XVT-Power++ application framework and the integration of Rogue Waves Tools.h++ data structures.

XVT-Architect provides graphical development of portable C++ applications by providing point-and-click interaction with the XVT-Power++ object hierarchy. It comprises Blueprint, Drafting Board and Object Strata modules.

The XVT-Power++ framework has been enhanced to include portable images, portable native font access and a portable hypertext help system.

XVT Development Solution for C++ 3.0 costs $1,950 for PCs and $6,300 for workstations.

▶ *XVT Software*
(303) 443-4223

CenterLine Software, Inc. has announced ResourceCenter, a software reuse environment.

According to the Cambridge, Mass., firm, ResourceCenter lets development organizations quickly catalog, locate and retrieve reusable software assets.

The product is built on a client/server architecture and scales across an organization. It features a lexicon-based searching technology.

Users can locate and retrieve assets from within source and object code, documentation, design documents, electronic-mail messages and bug-tracking reports.

Prices start at $19,995.

▶ *CenterLine Software*
(617) 498-3000

Rational Software Corp. has announced SoDa, a software documentation tool.

According to the Santa Clara, Calif., company, SoDa generates documents using data extracted from information sources such as software engineering tools, requirements databases and code.

The product synchronizes documents with development projects and incrementally updates the portion of documents affected by changes to the system.

SoDa produces documents for every phase of the software development process and can be integrated with a variety of software engineering products.

SoDa costs $6,000.

▶ *Rational Software*
(408) 496-3600

ILOG, Inc. has announced ILOG Schedule, a scheduling application development tool.

According to the Mountain View, Calif., company, ILOG Schedule lets developers create complex scheduling applications such as manufacturing job-shop scheduling, network load balancing, maintenance scheduling and time tabling.

The product provides for the definition of single resources, volume resources such as a group of people and state resources such as configurable resources defined by a physical state.

ILOG Schedule costs $10,000 for Unix workstations and $6,500 for PCs.

▶ *ILOG*
(415) 390-9000

Product short

Blyth Software, Inc. has introduced Omnis 7(3) for the Power Macintosh, a client/server development environment. The product includes true portability and invokes the native graphical user interface of the operating environment without requiring the developer to recode for Windows or the Macintosh. Omnis 7(3) for the Power Macintosh requires Omnis 7(3) Portable Client/Server Enterprise Kit. Cost: $250 for users of the Enterprise Kit. Blyth Software, Foster City, Calif. (415) 571-1132.

Get results like these when you migrate from an IBM mainframe to Unix.

"We made the scheduled migration date. Could not have done it without Workstation products. Needed capabilities that vi and other products didn't offer - only uni-XEDIT." —Bellcore

"More feature rich than alternatives...the uni-SPF development platform put it head and shoulders above anything else." —Chrysler

"Products were very portable and efficient. We don't believe there is anything else that will do the job." —A.C. Nielsen

"Got our users up on new system instantly. The whole migration resulted in $1M per year savings. Got applications moved in 4 months. On target and on budget." —G.D. Searle

1-800-228-0255

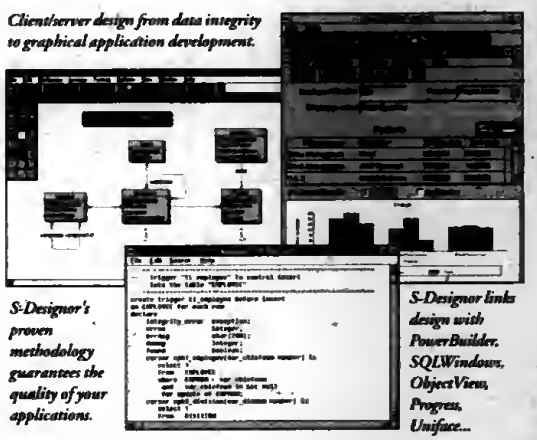
wrk/grp the workstation group — the business choice for open systems

The Hottest In Client/Server Design™

Add some zip to the menu! S-Designor empowers you to design over thirty databases and interfaces with PowerBuilder, SQLWindows, ObjectView, Progress & Uniface. . . allowing you to fully integrate client/server design and development.

Powerful Application Modeling. Design your database with a user-friendly Windows interface in three simple steps. First, draw your conceptual model of Entities and Relationships. Next, S-Designor generates a physical model of your database. Here you can enhance tables, references, integrity rules, and indexes—even describe the attributes for the graphical user interface of your client/server applications. Finally, S-Designor automatically creates your database script. At each step, S-Designor delivers detailed reports to streamline communication and promote effective maintenance. Export reports to your word processor or even create your own customized, quality documentation.

Client/server design from data integrity to graphical application development.



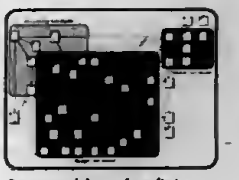
S-Designor's proven methodology guarantees the quality of your applications.

S-Designor links design with PowerBuilder, SQLWindows, ObjectView, Progress, Uniface...

Database Generation and Reverse-Engineering. S-Designor generates scripts and integrity triggers for Oracle, Sybase, Informix, Ingres, SQL Server, DB2, AS400, SQLBase, RDB, Progress, Paradox, Access, FoxPro and many more. Reverse engineering translates your existing database into physical and conceptual models to facilitate maintenance and documentation. Generate alter commands for tables and indexes, or even create scripts for a different target database.

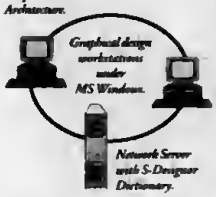
Client/Server Design for PowerBuilder, SQLWindows, ObjectView, Progress, Uniface... At the client level, S-Designor handles the graphical user interface attributes which apply to your choice of 4GL tools. S-Designor's database generation at the server level meets your referential integrity needs through declarative constraints and triggers and enforces data integrity all the way down to its implementation into your database. Fully integrating design and development, S-Designor's powerful client/server interface transfers all modeling objects into the development tool dictionary. That gives you efficient application generation and increased productivity while preserving application integrity.

A Complete Product Line. Thanks to its intuitive Windows interface, S-Designor Classic allows newcomers as well as experienced developers to master its capabilities within minutes. S-Designor Professional enables complex system designers to break large global models into more manageable sub-models.



Large models can be split into smaller sub-models.

Corporate Edition Architecture.



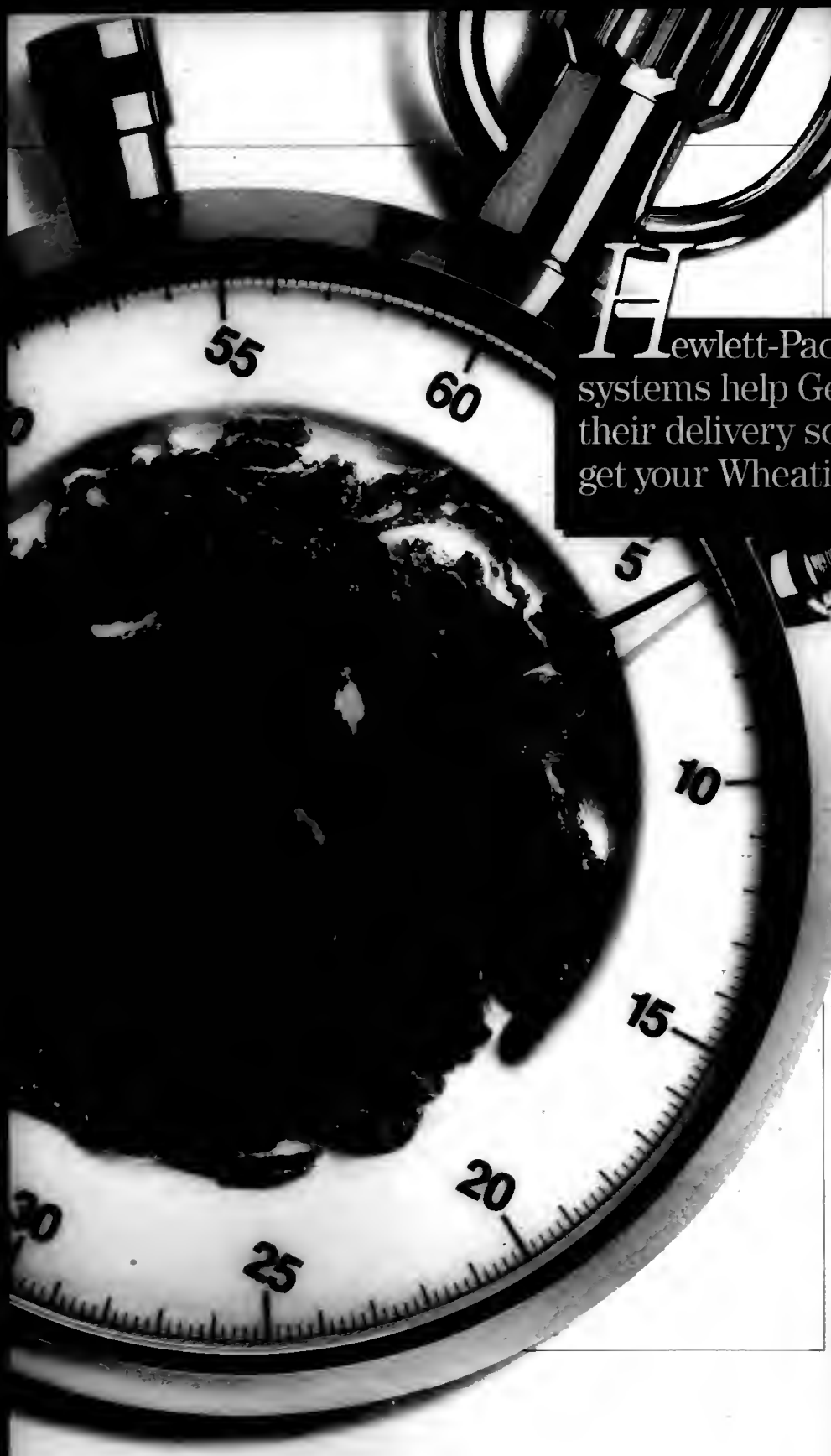
Ultimately, release your team's full potential with S-Designor Corporate; through a dynamic central dictionary, its users share the same design information.

Client/Server Design with Spice. With all these powerful features combined, S-Designor is the kick you need for red hot, client/server design. See for yourself and call today for your free test drive.

Free Test Drive (708) 947-4250

SDP TECHNOLOGIES, INC. • ONE WESTBROOK CENTER
SUITE 805 • WESTCHESTER, IL 60154
PHONE: (708) 947-4250 • FAX: (708) 947-4251

S-Designor is a trademark of SDP Technologies, Inc.



Hewlett-Packard computer systems help General Mills crunch their delivery schedules. So you get your Wheaties even fresher.

"Not only is the HP 3000 open, but it's an excellent, easy-to-use transaction-processing system for business-critical operations."

— Mike Meinz,
General Mills, Information Systems

The demand for Wheaties®, Cheerios® and other General Mills' products is huge. Which puts enormous demands on the company's distribution and inventory control systems.

They needed a way to deliver faster, while making sure each shipment was complete and contained only the freshest products. They solved the problem crisply by porting a UNIX®-based warehouse management application to HP 3000 computers.

This is helping General Mills perform like a champion. The HP 3000s, located in all nine distribution centers, are managed remotely, without extra staff. And they provide near 100% uptime. Which takes the worry out of running critical applications.

If you need a faster way to market, call 1-800-637-7740, Ext. 7804 for a video case study. We think it will whet your appetite for more.

HEWLETT® PACKARD

UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. Wheaties and Cheerios are registered trademarks of General Mills, Inc. ©1993 Hewlett-Packard Company CSY9315

OPINION
Look out for "leadertype."
Page 86

BAH, HUMBUG!

When it comes to the latest IS trends, products and technologies, our readers cast a skeptical eye when separating fads from the truly fantastic

BY ROCHELLE GARNER

Sometimes it seems as if the computer industry is made up entirely of fads. Small wonder, what with pundits constantly extolling the virtues of this new technology or that new management trend. Listen long enough and it begins to sound like a troupe of carnival bucksters hawking tickets to see the Amazing Dogface Boy.

Unfortunately, it isn't about to change, what with every novelty to hit this quicksilver market practically guaranteed its 15 minutes of fame.

So how can you distinguish fads from the truly useful technologies? With a healthy dose of skepticism, that's how. The question is, which of the myriad products, technologies and trends out there warrant a jaded eye?

Computerworld wanted to find out — but not by asking all those pundits chatting up their current objects of affection. Nope, we wanted to know what *you* think deserves to be tossed into the dustbin of history. Our tool: a survey answered by 290 readers.

Your answers surprised us. Technologies we thought were near death, for example, you said will be around in five years. Conversely, you saw the tin beneath the gilded trends that many in the industry consider 14 carat.

Consider, for example, that shining principle known as re-engineering. If many readers' powers of forecasting prove accurate, it won't be around much in five years. Your reasons proved most enlightening—

HUMBUG, page 84

While respondents didn't express extreme skepticism for any particular management or business trend, some trends raised more eyebrows than others

HERE TODAY, GONE TOMORROW?

Management and business trends considered the least likely to still be around in five years:

Management trends

- Outsourcing mission-critical and/or competitive advantage systems
- Hiring CIOs with business, not IS backgrounds
- IS as a for-profit business unit
- The CIO title
- Account manager (IS-user intermediary) position

Business trends

- Re-engineering
- Virtual companies
- Consensus-style management
- Learning organizations
- Self-managed work teams

THE REAL THING

Management and business trends most likely to thrive or survive, according to respondents:

Management trends

- Electronic distribution of software
- Training IS personnel to be business-minded
- Building information architecture
- Seeking quantitative return-on-investment justifications for information technology investments
- Long-term (three years or more) IS strategic planning

Business trends

- Electronic commerce
- Telecommuting
- Delighting the customer as employees' top goal
- Information technology for competitive advantage
- Tying pay to individual performance

Humbug

CONTINUED FROM PAGE 83

ranging from disapproval of the methodologies now in vogue to disgust with the buzzword itself.

"I interpret re-engineering as a huge episodic effort to remake the business," says Chayim Herzig-Marx, director of Information Resources and Services at Harvard University. "I think we will reach the conclusion that [that] isn't the right way to improve."

His prescription: Fine-tune business processes through smaller, more incremental adjustments. "That way we can build in flexibility and more readily manage the changes we make," Herzig-Marx says.

Nothing new

Jim Harper, vice president of information systems at SuperGlue manufacturer Loctite Corp. in Newington, Conn., holds a more cynical and more typical view: that re-engineering is just a new word for an old process.

"Re-engineering is nothing more than analyzing a process to see how you can cut out superfluous functions. That's no different from what we did 15 years ago, only then we called it a 'systems study,'" Harper says. "The activity will always be around. We just won't be calling it re-engineering in five years."

Another trend that earned your scorn was the practice of outsourcing mission-critical or competitive advantage systems. The idea of moving something this important out of your immediate control gives many of you the willies.

Just ask Ronn Koester, director of MIS at Hickory Farms, Inc. in Maumee, Ohio. His mission-critical order-taking applications will soon leave their digs in Dallas, where they were maintained by an outsourcer, and return home to Ohio. Why? Cost and control reasons, mainly.

"Control in that if we have any problems whatsoever, we have to call Dallas and hope that they can work things out. And it's been my experience that they can't always do things in a timely manner," Koester says.

Time is of the essence

That timeliness translates into cost, especially for a catalog company that earns 85% of its revenue in the eight weeks before Christmas. In that critical period, waiting half an hour for the Dallas staff to mount a tape can cost Hickory Farms $50,000. A four-hour phone outage at the outsourcer last year rang up a $500,000 loss for Hickory Farms, not to mention the incalculable damages stemming from customer dissatisfaction.

"We can look at a package of hardware and software with a diesel generator for backup power and still spend $150,000 less a year for a more functional and more powerful system than we have with our outsourcer," Koester says.

Word of such experiences has made its way to the IS grapevine, causing IS managers to cast a jaundiced eye on outsourcing anything that is remotely critical.

Similar word of mouth has touched on the issue of hiring chief information officers with business, but no IS, backgrounds. That word is "yuck." After all, you told us one can't expect strictly business-oriented managers to make strategic technology decisions when they don't understand the technology function they head.

Earl Shaffer, a senior software engineer at the Care Management Systems of Johnson & Johnson Co. in Tampa, Fla., has watched as two such CIOs were asked to leave. "People from finance, who wouldn't know a Pentium from a bicycle, look at IS changes in terms of cost," Shaffer says. "That's not the kind of planning you need at the CIO level because IS is a process, not a thing."

Most of you agree, it seems, often citing the pace of technological change as the reason why business acumen alone won't cut it.

"As technology evolves to a truly more difficult and technical environment, a CIO without an IS background can't weigh the issues of where to apply the technology, how to apply it and IS' role in developing and deploying that technology," Harper says.

So does that mean, by inference, that training IS personnel to be business-minded is another short-lived fad? It depends on how you define "business-minded," you told us. If it means minding the bottom line, forget it. But if it's imbuing the needs of the company in all IS activities, then it's very real and critical.

"IS' role is to support the business, and to do that, it needs to be a part of the business," says Thomas Murphy, director of MIS at Bruce McGaw Graphics in New York. "To do their jobs correctly, my staff needs to know what makes our business run."

Looking into the future

Which brings us to the question of what will run IS five years from now. Not an Apple Computer, Inc. server or Digital Equipment Corp. Alpha chip, you say.

The reasons you gave were varied. Oh sure, there were complaints about Apple's inability to come up with a decent server and the probability that the high-speed Alpha chip today will look like the 8088 tomorrow. But among the readers we spoke with, the most cited reasons came down to the feeling that neither Apple nor Digital will be a major player in five years.

"I'm skeptical that Apple will survive in the current climate," says Howard Halpin, senior vice president of information and technology at the Aircraft Owners and Pilots Association in Frederick, Md. "If they do survive, it will be strictly in niche markets."

One such niche could be for personal digital assistants. Readers predicted they would not be in widespread use in five years, but they would still be around (along with pen computing, neural networks and voice-operated computing).

Still, it's a bit of a shock to find that many readers think these technologies have a future. Listen closely to the pen computer market, for example, and you can hear its death rattle.

Why any optimism at all. "I don't think any technology ever purely dies," says David Lozupone, director of MIS at Columbia Artists Management, Inc. in New York. "It either ends up in some niche or evolves into something else."

And that, it turns out, sums up why so many readers think these technologies will eventually find a use and a market. And it just proves that skepticism — and optimism — often show up in the most unexpected places. ■

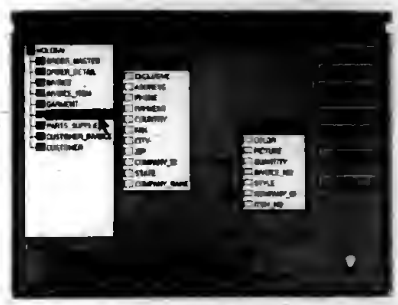
Garner is a free-lance writer in San Carlos, Calif.

Tarnished trends and technologies

Respondents found the following products, trends and technologies as the least likely to make the grade in five years:

PRODUCTS	TRENDS	TECHNOLOGIES
Apple servers	Pen computing	Alpha
Pentium-upgradable 486 PCs	Neural networks	Smalltalk
Personal digital assistants		OS/2
		Solaris

1 Relax and take a deep breath. SQLWindows® is your quickest way to build and deploy problem-solving applications just like this one. For the quickest start, choose a QuickForm to lay out your application and make all the appropriate connections.



2 QuickForms let you choose data from any database, identify fields and automatically create master/detail links. A simple button click generates your QuickForm. By the way, xBASE and Paradox® data drivers are included to help desktop developers move up.

3 Next, customize your QuickForm by choosing QuickObjects from the tools palette. Each QuickObject chosen will be automatically linked to your data sources. In this case, just drag and drop a QuickRadioGroup so users can select shirt colors with intuitive radio buttons.

4 What good are color selections in a Hawaiian shirt company if your "can't see them"? SQLWindows applications can easily incorporate graphical data from any file, OLE server or database, with the QuickPicture QuickObject. Just place and size the picture box in your form. See? You still haven't written a tok of code!

When Molokai Outfitters opened their new branch warehouse, QuickObjects from Gupta kept their finger off the panic button. Only available in SQLWindows 5.0, QuickObjects made sure Molokai's critical sales order entry application got delivered in a flash!

Quickly build powerful client/server applications.

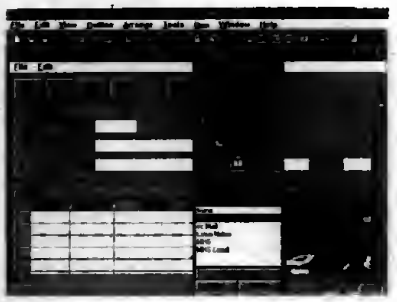
Now, client/server applications are in your grasp. New QuickObjects from Gupta make "drag & drop" application development a productive programming alternative to dreary, repetitive coding. In fact, any developer can now build full-featured client/server applications regardless of prior experience. Novices can skip complicated coding and veteran developers can boost productivity before resorting to code for extended functionality.

INTRODUCING SQLWindows 5.0

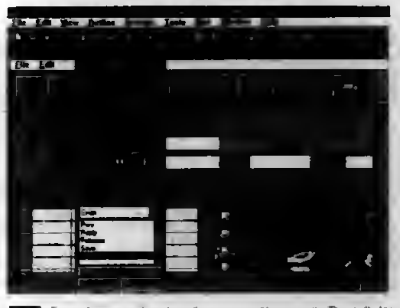
Four ways to a quick start and the power to finish.

SQLWindows Solo™ builds single-user desktop applications. Limited single-user deployment included.

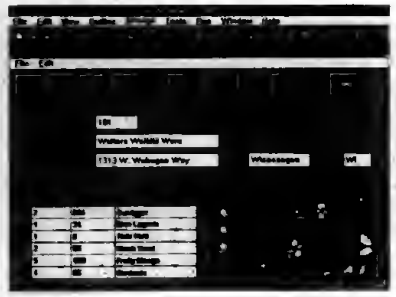
How QuickObjects™ from Gupta kept Molokai from losing its shirt.



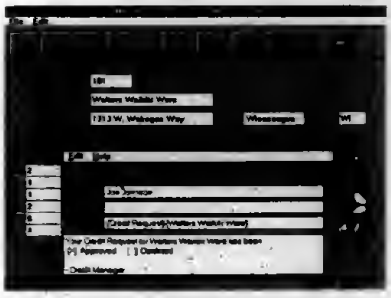
5 Painless workgroup integration is just a point-and-click away. Select the QuickEmail object, choose your mail system from the options listed and drop an e-mail data source into your form. Now users anywhere on the network can be notified when an order affects them or requires some action on their part.



6 For instance, each order will require credit approval. This calls for an e-mail QuickObject, a pre-defined pushbutton with built-in code to execute e-mail tasks. To run credit checks via e-mail, choose the "Send" e-mail QuickObject and drop a "Send" button on your form's toolbar. Now any user of the application will be able to notify the Credit Department when an order is placed and secure their approval to ship – all via e-mail without leaving the application.



7 Now, test your application. Click on the "Run" button in the SQLWindows toolbar. Any errors will be flagged by the internal debugger and a runtime application will be created. Then, for blazing speed, just punch the adjacent SQLWindows Compile button to tap the performance of the industry's first 4GL compiler.



8 Congratulations. You've just built a powerful client/server mail-enabled application that integrates graphical and SQL data anyone can use. And you'd do it in less than 15 minutes! Now, Walter's Waterbed Ware in Wisconsin will get the 72 dozen Outrigger sheets they need by next week and you'll be modeling Molokai Outfitters' latest styles on the very beaches that inspired them.

SQLWindows Starter Edition builds fully networked SQL applications and adds Lotus Notes® integration. Deployment licenses are extra. **SQLWindows Network Edition** also builds fully networked SQL applications with full network deployment licenses included. **SQLWindows Corporate Edition** adds team programming, a fast compiler and a complete set of extended interfaces to CASE products, source control systems and other advanced tools. At list US $99, $995, $1995 and $2995 respectively, no client/server development line packs more choice or value.

SQLWindows Solo
FREE
At Gupta Seminars
1-800-876-3267
Call to Register

Get started FREE with a seminar and SQLWindows Solo!

We want network-savvy developers everywhere to get a QuickStart on client/server. So call now to reserve your place at a FREE Gupta seminar near you, where you'll also get a FREE copy of **SQLWindows Solo.** See for yourself how quickly you can build client/server applications users love. Make the leap to client/server without losing your shirt. Call **1-800-876-3267** Ext. 321 to make your seminar reservation today!

GUPTA
THE POWER TO GET CLIENT/SERVER DONE

© 1994 Gupta Corporation • 1060 Marsh Road, Menlo Park, CA 94025 • 415-321-9500 • Fax 415-321-0971 • Gupta, SQLBase, SQLRouter, SQLHost and SQL Talk are registered trademarks of Gupta Corporation. SQL, API, SQL Network, GTE Centra, QuickStarts, Fast Forms, Gupta and the Gupta Powered logo are trademarks of Gupta Corporation. SQLWindows is a registered trademark and TeamWindows, ReportWindows and EditWindows are trademarks licensed, used and licensed by Gupta Corporation. Other trademarks are the property of their respective owners.

Allan E. Alter

Leadership vs. leaderhype

Pity the poor CIO. Besides the latest techno-boggle, he must put up with another form of vaporware.

Call it leaderhype.

CIOs are constantly told they should seize the day and take a leading role in their companies, that it is their manifest destiny to drive change and steer their company into a radiant, technology-enabled future. And ever since re-engineering arrived on the scene, IS executives have been told that this latest business nostrum provides a wonderful opportunity for CIOs to extend their influence.

Well, here's a two-word answer for that sort of talk: Get real.

Maybe there's some parallel universe where IS executives are the vanguard of the management class. It certainly isn't this universe, and most CIOs know better.

The point was brought home for me on a hot July day in Cincinnati, where I joined 25 veteran Fortune 500 IS executives gathered under the auspices of the Conference Board.

A senior vice president at a leading consulting firm (who must remain nameless under the terms of my invitation) gave a presentation on the implications of re-engineering for CIOs. He told the group that business re-engineering offers technology a seat at the executive table. It provides an opportunity for the chief technology officer to step up to a broader role as chief change agent.

The attendees cut him off at the knees. One after the other, they said that in the real world, IS executives almost never lead or introduce organizational change in their companies.

Kathy Brittain White, an IS vice president at Allied Signal, Inc.'s Engineered Materials business unit, was one of those in the room. Her views were typical of the group: "Most of us are not positioned to come in and tell a business what to do. We can be part of the process but not be the head of the process. That is not the role most companies allow us to play," she told me.

> Maybe there's some parallel universe where IS executives are the vanguard of the management class. It certainly isn't this one.

Exception to the rule

Yes, there may be occasions where personalities, executive egos, corporate culture and skills are aligned in such a way that the right CIO can be the chief change agent. And sometimes comets smack into Jupiter, too. Such events are exceptions, not everyday occurrences. Generally, the best that CIOs can reasonably expect is to be partners — and usually junior partners — with non-IS management in helping to institute change.

It isn't that these CIOs are wimping out or are congenital introverts. And it isn't that CIOs lack experience as change agents, for who does have that kind of experience? It's simply that few IS executives have the experience that most impresses other executives: experience running businesses.

Furthermore, few CIOs enjoy the institutional standing that comes with being a corporate officer or director. Most haven't built the kind of trust that comes with lengthy service at one company and haven't inherited a position that historically carries clout. And, according to White, there is no law that says other executives have to cooperate or get along with the CIO.

In his article "What Makes A Good Leader?" published in the April 1994 issue of the *Atlantic Monthly*, the Pulitzer Prize-winning historian Gerry Wills observes that there are no leaders without followers and that in a democracy, "the leader is one who mobilizes others toward a goal shared by leader and followers."

But what worked for Franklin D. Roosevelt cannot work for CIOs. He had to persuade millions of voters to elect and reelect him to several four-year terms. CIOs, on the other hand, are appointed and fired at the whim of one person. They must appeal to executives who do not like to think of themselves as followers. Most importantly, CIOs are responsible for technology, and technology is not a goal but a tool.

For CIOs, effective leadership isn't primarily about finding followers; it's about building voluntary partnerships with strong-willed executives who also think it's their job to be change agents — and who may actually be right.

IS executives who overstep those bounds are far more likely to wind up victims of leaderhype than paragons of IS leadership.

Alter is *Computerworld*'s senior editor, management.

Executive Track

VSI Enterprises, Inc., a videoconferencing systems development company in Norcross, Ga., has announced the appointment of **Leo M. Cortjens**, 40, as president and chief operating officer. He succeeds Paul A. Scott, 44, who left the company in June. Cortjens was formerly vice president of technology at the company.

Ann M. Purr has been elected president-elect of the **Association for Systems Management** (ASM) in Cleveland. Purr is assistant vice president of information management products and services at the Life Office Management Association, where she has worked for 17 years. She has been an ASM member since 1978. She is a member of the Atlanta chapter of ASM and has held numerous positions at every level of the association. In 1990, she earned the association's Distinguished Service Award for outstanding contributions.

The Internal Revenue Service has announced the appointments of **Angela P. Mackson** as assistant regional commissioner for data processing in the IRS' central region and **Charles W. Peterson** as assistant director at the Philadelphia

Service Center. Mackson will be responsible for assisting the regional commissioner in planning, coordinating and evaluating returns processing, computer services, revenue accounting, public affairs and taxpayer service activities at the central regional office. The central region includes Cincinnati, Cleveland, Detroit, Indianapolis, Louisville, Ky., and Parkersburg, W. Va. Peterson will assist the service center director with processing federal tax returns and other services for taxpayers in Delaware, Maryland, Virginia, Pennsylvania, the District of Columbia and Puerto Rico.

Alydaar Software Corp. in Madisonville, La., has announced the appointment of **Daniel M. Brandon** as director of data management technologies. He will be responsible for developing the company's database translation and migration re-engineering projects. Prior to joining Alydaar, Brandon was director of information systems for the prime technical contractor at NASA-Stennis Space Center. While at NASA, Brandon oversaw applications design and development, systems administration, data communication and all strategic IS planning, including migrating applications from mainframe to client/server.

MapInfo Corp. in Troy, N.Y., has announced the appointment of **Kirvan H. Pierson III** as a director of software development. Prior to joining MapInfo, Pierson was a manager of software development at Roadnet Technologies, Inc., a subsidiary of United Parcel Services, Inc.

J. P. Morgan & Co. in New York has announced the appointment of **William M. Hewitt** as vice president. He will be responsible for managing relationships between the corporate technology division of the investment bank and the divisional businesses it serves. Prior to joining J. P. Morgan, he was manager of marketing operations at IBM subsidiary Integrated Systems Solutions Corp.'s disaster-recovery facility in Sterling Forest, N.Y.

Stanford University in Stanford, Calif., has announced the appointment of **Glen Mueller** to the newly created position of chief information officer for the university's Libraries and Information Resources Division. The appointment comes in the midst of the division's reorganization. Mueller will be responsible for the development and operations of networking and communications services, information systems, data administration and technology support for instruction, research and administrative activities. Mueller had been director of internal audit at Stanford. In addition to Mueller's appointment, **Michael Keller** has been appointed Ida M. Green University librarian and director of academic information resources. Keller will be responsible for maintaining the integration of the libraries and academic information resources, as well as some networking and communications services. Both Mueller and Keller will report to Chief Academic Officer Provost Condoleezza Rice. The division's reorganization was driven by the need to overhaul the university's administrative computer system.

Grant Thornton, the international accounting and management consulting firm, has announced the appointment of **Mark Oster** as senior manager in the management consulting practice. He will work with clients to address information technology business strategies, financial planning, operations management, productivity improvement, product liability and litigation support. Prior to joining Grant Thornton, Oster held senior information systems management positions at Simon and Schuster, Philip Morris Co. and Arthur Anderson & Co.

Cargill, Inc. in Minneapolis has announced the appointment of **Guillaume Bastiaens** as president of the company's food sector. Prior to his appointment Bastiaens was chief technology officer at Cargill.

Join the only class of developers who can get client/server done.

Get the quickest start in client/server.
Now client/server applications are in your grasp. Come to Gupta's free developers' seminar and you'll get everything you need to get powerful client/server applications done.

FREE SEMINAR
FREE SQLWindows Solo™

In one power-packed morning, learn how to build full-featured client/server applications in minutes, using the QuickObjects™ "drag & drop" programming system introduced in the new SQLWindows® 5.0 from Gupta. Then go beyond "the basics" into extended capabilities that give you the power to handle the most challenging workgroup, branch-office and mobile computing applications.

Get the power to finish.
Start using your new skills immediately with your own copy of SQLWindows Solo. This complete development package for single-user applications, a $99 value, is given absolutely free to every seminar participant.

There's no quicker way to get started in client/server. But you've got to be quick to reserve your place. Call now:

1-800-876-3267 Ext. 331

SQLWindows Solo $99 value FREE to every participant

SQLWindows Solo gives any developer a fast start on client/server expertise. With its easy, Quick Start guide, SQLWindows Solo offers the complete SQLWindows 5 development environment in a low-cost package for developing single-user client/server applications. Applications can be upgraded for network use when you step up to SQLWindows Starter, Network or Corporate Editions.

GUPTA™
THE POWER TO GET CLIENT/SERVER DONE.

Choose the most convenient seminar. Place your reservation today. Space is limited.

1-800-876-3267

Seminar Dates and Locations

Northeast
Hartford, Connecticut
Sept. 14 Oct. 18

Stamford, Connecticut
Sept. 29

Wilmington, Delaware
Oct. 5

Boston, Massachusetts
Sept. 15 Oct. 13 Nov. 15 Dec. 6

Saddlebrook, New Jersey
Sept. 28 Oct. 26

New York, New York
Sept. 13 Oct. 11 Nov. 6 Nov. 29

Albany, New York
Oct. 12

Rochester, New York
Sept. 20

Providence, Rhode Island
Sept. 22

Philadelphia, Pennsylvania
Sept. 27 Oct. 25 Nov. 21

Pittsburg, Pennsylvania
Oct. 4 Nov. 1

Mid-Atlantic
Washington, DC
Sept. 14 Oct. 19 Nov. 16 Dec. 7

Baltimore, Maryland
Sept. 15 Nov. 2

Raleigh/Durham, N. Carolina
Sept. 20 Oct. 25

Charlotte, N. Carolina
Sept. 29 Oct. 26

Richmond, Virginia
Sept. 21 Oct. 13

Southeast
Orlando, Florida
Sept. 27 Oct. 20

Miami, Florida
Sept. 22 Oct. 18 Nov. 17

Atlanta, Georgia
Sept. 13 Oct. 11 Nov. 9

Central South
New Orleans, Louisiana
Oct. 5 Nov. 8

St. Louis, Missouri
Sept. 13 Oct. 12 Nov. 10 Nov. 29

Kansas City, Missouri
Oct. 6 Nov. 3

Nashville, Tennessee
Sept. 22 Nov. 15

Central North
Louisville, Kentucky
Oct. 6 Nov. 17

Chicago, Illinois
Sept. 13 Oct. 11 Nov. 8 Nov. 29

Indianapolis, Indiana
Sept. 28 Oct. 25

Evansville, Indiana
Sept. 27

Des Moines, Iowa
Sept. 22 Oct. 13

Detroit, Michigan
Sept. 20 Oct. 12 Nov. 16 Dec. 8

Ann Arbor, Michigan
Oct. 19

Minneapolis, Minnesota
Sept. 15 Oct. 4 Nov. 1 Nov. 30

Cleveland, Ohio
Sept. 29 Oct. 27

Columbus, Ohio
Sept. 21 Nov. 9

Cincinnati, Ohio
Oct. 5 Nov. 10

Milwaukee, Wisconsin
Sept. 14 Nov. 2

Madison, Wisconsin
Oct. 12 Nov. 17

Central West
Denver, Colorado
Sept. 15 Oct. 11 Nov. 8

Colorado Springs, Colorado
Sept. 29

Kansas City, Kansas
Sept. 20 Nov. 16

Omaha, Nebraska
Sept. 21 Oct. 18

Tulsa, Oklahoma
Sept. 14 Nov. 2

Houston, Texas
Sept. 27 Oct. 25 Nov. 22

Dallas, Texas
Sept. 13 Oct. 8 Nov. 1 Nov. 29

Austin, Texas
Oct. 20

Southwest
Phoenix, Arizona
Sept. 22 Oct. 20 Nov. 9

Las Vegas, Nevada
Sept. 15 Nov. 2

San Diego, California
Oct. 4 Nov. 1

Los Angeles, California
Sept. 20 Oct. 18 Nov. 15 Dec. 8

Orange County, California
Sept. 21 Oct. 19

Sacramento, California
Sept. 28 Oct. 26

San Francisco, California
Sept. 13 Oct. 12 Nov. 10 Dec. 7

Oakland, California
Sept. 27 Nov. 22

San Jose, California
Sept. 14 Oct. 11 Nov. 8

Salt Lake City, Utah
Sept. 29 Oct. 27

Northwest
Portland, Oregon
Sept. 22 Oct. 27

Seattle, Washington
Sept. 21 Oct. 19 Nov. 18

Anchorage, Alaska
Oct. 4

Canada
Toronto, Ontario
Sept. 20 Oct. 25 Nov. 8 Nov. 28

Montreal, Quebec
Sept. 21 Sept. 22

Ottawa, Ontario
Sept. 27 Oct. 26

Calgary, Alberta
Oct. 5

Regina, Saskatchewan
Sept. 13

Edmonton, Saskatchewan
Oct. 8 Nov. 3

Vancouver, British Columbia
Sept. 14 Oct. 18

©1994 Gupta Corporation • 1060 Marsh Road, Menlo Park, CA 94025 • 415/321-9500 • Fax 415/321-5471 • Quest, SQLBase, SQLGateway, SQLRouter, SQLHost and SQLTalk are registered trademarks of Gupta Corporation. SQLAPI, SQLNetwork, SQLConnect, QuickObjects, Fast Facts, Gupta and the Gupta Powered logo are trademarks of Gupta Corporation. SQLWindows is a registered trademark and TeamWindows, ReportWindows and EditWindows are trademarks exclusively used and licensed by Gupta Corporation. Other trademarks are the property of their respective owners.

Calendar

OCT. 2-8

The 1994 Computer Training & Support Conference. Atlanta, Oct. 2-5 — Topics: management challenges, retooling, training, workplace technology, interactive multimedia, service excellence, documentation, certification and testing. Contact: Ziff Institute, Cambridge, Mass. (617) 252-5187.

The Annual Data Administration/IS Conference & Trade Show. Orlando, Fla., Oct. 2-5 — Contact: Data Administration User Group, Bayonne, N.J. (201) 823-4800.

The East-West Conference. Knoxville, Tenn., Oct. 2-5 — Showcases business and trade opportunities in European, Asian and Canadian markets and highlights two panels on the topics of technology transfer and the information superhighway. Contact: University of Tennessee Conference Center, Knoxville, Tenn. (615) 974-0250.

Strategic Multimedia Conference: Opportunities for Multimedia in the 1990s. Lake Buena Vista, Fla., Oct. 3-4 — Contact: TWA/Frost & Sullivan, Santa Clara, Calif. (800) 256-1076.

1994 National Association of State Information Resource Executives (NASIRE) Annual Conference. San Francisco, Oct. 3-5 — Theme: "Blazing the Trail: Shaping Information Technology." Topics: economic development, procurement laws/practices, electronic commerce, funding issues for information resources and public/private partnerships. Contact: Mary Alice Sosby, NASIRE, Lexington, Ky. (606) 231-1905.

Power '94: The Second International Conference on Power Requirements for Mobile Computing and Wireless Communications. Santa Clara, Calif., Oct. 3-5 — Topics: batteries, semiconductors, portable computing, cellular devices and services, software peripherals, components and systems integrators. Contact: BIS Strategic Decisions, Norwell, Mass. (800) 874-9980.

Wireless World Expo '94. Orlando, Fla., Oct. 3-5 — Contact: E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

Software Development SD '94. Washington, Oct. 3-8 — Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2784.

Gartner Group Symposium/Information Technology Expo '94. Lake Buena Vista, Fla., Oct. 3-7 — Presentations include five-year strategic planning scenarios, roundtable discussions and product education sessions. Contact: Gartner Group, Inc., Stamford, Conn. (203) 967-6871.

Supporting & Troubleshooting OS/2: Practical Guidelines for Installing, Maintaining and Enhancing the OS/2 Environment. Washington, Oct. 4-5 — Also showing in San Francisco, Oct. 18-19. Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

Unix Expo. New York, Oct. 4-6 — Keynotes: Tim O'Reily, president, O'Reily and Associates, Inc., speaking on "The Internet and its Role in the Business Community; and Lawerence J. Ellison, president and chief executive officer, Oracle Corp., speaking on "Parallel Software for Information Management." Full conference fee: $320 in advance, $360 on-site. Contact: Annie Scully, Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

Eighth Annual Idaho National Engineering Laboratory Computing Symposium. Idaho Falls, Idaho, Oct. 4-7 — Contact: EG&G Idaho, Inc., Idaho Falls, Idaho (208) 526-7785.

Law conference addresses Internet issues

The growing and complex legal questions regarding conducting business on the Internet will be the subject of a two-day conference in New York, Sept. 29-30.

The conference, Legal and Business Aspects of the Internet and Online Services, is being sponsored by Law Journal Seminars-Press in New York. It will be held at the New York Hilton Hotel.

The conference will focus on issues of intellectual property, communications and entertainment law. Seminars will include such topics as privacy — corporate and personal, doing business on-line, crime on the networks, current and pending legislation and the National Information Infrastructure.

The event's chairpeople will be Ellen M. Kirsh, vice president, general counsel and secretary of America Online, Inc.; Lance Rose, Latice Rose & Associates; and Shari Steele, director of legal services at the Electronic Frontier Foundation.

For more information or to register, contact Jill Windwer at (800) 888-8300, ext. 6141, or via the Internet at windwer@delphi.com.

XSoft
A DIVISION OF XEROX

DO YOU HONESTLY KNOW WHERE YOUR DOCUMENTS ARE?

Industries using XSoft workflow solutions include:

AEROSPACE
ADVERTISING
AUTOMOTIVE
BANKING
EDUCATION
ELECTRONICS
ENGINEERING
FOOD PROCESSING
OIL AND GAS
GOVERNMENT
HEALTH CARE
LEGAL
MANUFACTURING
PHARMACEUTICAL
RESEARCH
TELECOMMUNICATIONS
UTILITIES

The single biggest information management problem facing business today is coping with the billions of documents it produces. That's why making your ever-increasing volumes of documents easier to locate and work with will increase productivity and profitability.

And that is exactly what XSoft's document productivity [illegible] are all about.

Through workgroup software solutions for office automation, [illegible] publishing and workflow, XSoft users will be able to locate and work with all their [illegible] wherever they reside.

Workers will be able to collaborate on the creation, revision and output of documents, from the simple [illegible] to complex productivity-critical [illegible] essential for company [illegible] data and information, [illegible] documents, information and knowledge assets are become in value.

Running on PC and UNIX platforms, XSoft solutions are completely scalable, guaranteeing future integration [illegible] ensuring your investment is future proof.

At XSoft we've been providing software solutions longer than anyone else involved in the [illegible].

If you work in a company that would benefit from XSoft document management products, and would like more information, or if you can benefit from a free consultation on the many advantages [illegible] business processes and bottom line, call 1-800-428-2995 s[illegible].

"What's truly distinctive about (XSoft) software is the way it lets users view search results without having to browse each document. This is particularly useful when a search yields dozens of different files."
Seybold Report on Desktop Publishing

XEROX® and XSoft® are trademarks of XEROX CORPORATION. UNIX® is a registered trademark of UNIX Systems Laboratories, Inc.

Fill it out. Fax it in.

Save $8

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgt. /PC Mgt., Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
80 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems

(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

COMPUTERWORLD

E4438-8

Recyclable Paper

Fill it out. Fax it in.

Save $8

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgt. /PC Mgt., Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
80 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems

(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

COMPUTERWORLD

E4438-8

Recyclable Paper

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 55 MARION, OH 43306

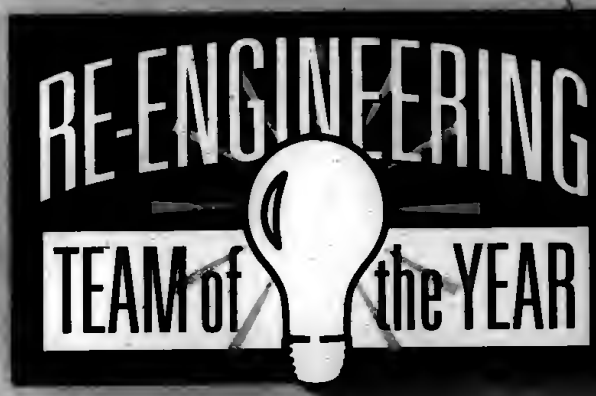
POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-2144

Strut Your Stuff

By entering *Computerworld*'s 3rd Annual Re-engineering Team of the Year Awards Competition.



ENTRY DEADLINE
NOV. 7, 1994

For complete entry details call the RE-ENGINEERING TEAM OF THE YEAR HOTLINE at

(800) 343-6474, Ext. 460

OR

Fax us your request at
(508) 875-8931

Attention: Re-engineering Team Awards.

BE SURE TO LEAVE YOUR NAME, COMPANY, TELEPHONE AND FAX NUMBERS.

COMPUTERWORLD

The Newspaper of Information Systems Management

Show off your great re-engineering project by entering the 1994 *Computerworld* Re-engineering Team of the Year Awards competition. This competition recognizes the team of IS professionals and users whose re-engineering efforts have made an especially outstanding contribution to their company.

We're looking for re-engineering efforts that have:

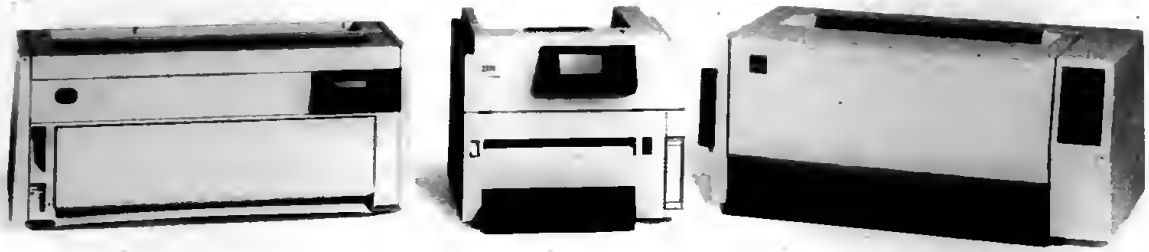
- Radically redesigned business processes;
- Made quantum-leap improvements over previous processes;
- Dramatically improved the company's bottom line and competitive position;
- Displayed outstanding IS-user teamwork.

In addition to a special awards ceremony and a trophy, the winning team will be profiled in the pages of *Computerworld* in January. So join past winners Banc One Corp. and Corning Asahi Video Products Co., and let the world know your team is a winner.

Submissions may be made by end-user organizations and vendors, consulting firms and system integrators on behalf of their clients. Companies selected for consideration will be contacted by a *Computerworld* representative for further details and verification. The winner will be chosen by a panel of *Computerworld* editors. All entries are the property of *Computerworld*.

© Computerworld, an IDG Company, is a trademark of Computerworld, Inc. Contest is void where prohibited by law. No purchase necessary.

First impressions are lasting.



Then again, so is the 13,500,000th.

You may print over 13 million characters with your IBM® LaserPrinter or type hundreds of thousands of characters with your IBM Wheelwriter® Typewriter before your toner cartridge or ribbon needs to be replaced. And each of these characters will be every bit as crisp and perfect as the first. Why? Unequalled quality and compatibility.

Lexmark, a former division of IBM, now an independent, worldwide company, manufactures IBM network and personal printers and typewriters along with the toner cartridge, ink or ribbon that they come equipped with. They are designed to work together to give you the highest-quality marks on paper. And the highest yields. Our 4039 Print Cartridge with marathon performance, for example, delivers over twice* the yield of the leading competitive cartridge. That means outstanding price performance and fewer cartridge changes.

So whether you print with our state-of-the-art 4039 LaserPrinter or type with our advanced Wheelwriter Typewriter, be sure to buy the supplies that were designed to bring out the best in your IBM equipment. IBM supplies by Lexmark.

To locate the dealer nearest you, to order, or to receive your free catalog, call 1-800-438-2468, ext. 130.

IBM Supplies by
LEXMARK™

Make Your Mark

IBM Supplies by Lexmark are manufactured under the International Standard ISO 9002 approved quality process.
Federal government agencies call 1-800-258-8575 for further information. In Canada, call 1-800-633-7662.

IBM and Wheelwriter are registered trademarks of International Business Machines Corporation in the United States and/or other countries and are used under license. Lexmark is a trademark of Lexmark International, Inc. ©1994 Lexmark International, Inc.
* Comparison based on claimed yields at 5% coverage of Hewlett-Packard Co. LaserJet® 4 print cartridge versus 4039 Print Cartridge with marathon performance.

IBM SUPPLIES BY LEXMARK. TAKE A CLOSER LOOK.

ROUNDTABLE

Trials and Tribulations

By Paul Gillin

MULLING A MOVE to client/server? You're not alone. A recent survey by *Computerworld Client/Server Journal* found that 36% of 200 organizations surveyed have large-scale applications already deployed in a client/server setup. But the move from the host environment is formidable and fraught with difficulties. To find out what those are, *Computerworld* Editor Paul Gillin sat down with information systems managers at four companies that set up mission-critical client/server applications. They spoke at the Client/Server Conference & Exposition in Washington late last month.

CW: Where do you stand in your move to client/server?

WOODS: We're well down the road to implementing all our engineering and manufacturing processes on client/server. Our primary motivation is the mother lode of innovation at the client/server level.

There's absolutely no worthwhile software being developed on mainframes or minicomputers.

Trials and tribulations, *page 112*

Who The Panelists Are:

Mike Knollinger

Ted Mountzuris

Jim Woods

Ian Miller

Mike Knollinger, director of information systems at Mead Data Central in Dayton, Ohio, is using ProTeam from Scopus Technology in Emeryville, Calif., to develop a customer support application.

Ted Mountzuris, director of application development at General Cinema in Chestnut Hill, Mass., is using SeQueL to Platinum from Platinum Software Corp. in Irvine, Calif., to develop a financial reporting application.

Jim Woods, chief information officer at Hughes Aircraft Co. in Los Angeles, is using Sherpa from Sherpa Corp. in San Jose, Calif., to integrate and manage engineering and manufacturing operations.

Ian Miller, senior director of architecture and emerging technology at Merck & Co. in Whitehouse Station, N.J., is using integrated HRMS from Tesseract in San Francisco to manage human resources and payroll applications.

Trials and Tribulations

CONTINUED FROM PAGE 91

MILLER: We've been fairly aggressive in investing in client/server for certain classes of applications. It was important to learn which applications are suitable and which aren't.

MOUNTZURIS: We've deployed about seven applications, using primarily [Powersoft Corp.'s] PowerBuilder and Microsoft Access with [Sybase, Inc.'s] Sybase and XDB. We've got an order management system that's just been converted, and we're working on a companywide problem management system that's much more ambitious.

KNELLINGER: In the area of building databases and acquiring information to go into them, we date back to 1986 or 1987 in client/server. We are also taking the company's Lexis/Nexis service and moving that to client/server.

Jim Woods: *"We have to make breakthroughs in the way we do business or perish"*

CW: What were the biggest surprises you encountered on your first major client/server project?

WOODS: The biggest surprise is that I'm dealing with companies that weren't in business three years ago, companies whose annual sales volume is half or less of my operating budget. I've moved from a career dealing with Hewlett-Packard and IBM to dealing with Sherpa or Western Data Corp. or Hughes LAN Systems or SynOptics. After about the fifth or sixth time we had committed our corporation to a $10 million or $20 million concern, my chairman of the board said he had a metric for me. He said, "Jim, the mean time between failures of the companies you do business with has to be equal to or greater than your retirement date."

The biggest problem for these client/server adopters? Fine-tuning for database performance, managing hidden costs and retraining mainframe staffers.

KNELLINGER: If you go in expecting your systems are going to last 15 to 25 years, you're going to be surprised when people come back in three years wanting to do things over again. For some people, that's a shock.

MILLER: The cost of managing the desktop components was higher than we imagined it would be. We have about 12,000 desktops. The cost of distributing one new application has run to six figures.

MOUNTZURIS: The biggest surprise is the hidden costs, especially in development tools. You find out you need DLL for this, an API for that, a connection to other databases, and that's all additional cost. And the software that vendors are selling has bugs like nothing I've seen in the past.

CW: Have any of you migrated transaction-intensive applications to client/server?

WOODS: Yes, in product data management. Our engineering and manufacturing release system is based on a commercial product called Sherpa and embodies all the information it takes to design, manufacture and field our products. We have it installed in nine sites processing tens of thousands of transactions a day.

CW: Did it replace a mainframe?

WOODS: Yes. Performance is reasonable, but we built the infrastructure around this product, which we can't afford to do on a per-application basis.

MILLER: We put our sales-order processing applications in a client/server environment from a mainframe system with AS/400s in the field. We had to learn how to engineer Oracle databases so they perform well in client/server. The other challenge has been operations and maintenance of equipment. Handling a couple of boxes is one thing; managing a series of boxes in a data center is another.

MOUNTZURIS: Performance tuning is the big thing. When we initially went to client/server, we started on an Intel platform and scaled up to Unix because of performance issues.

Ted Mountzuris: *The biggest surprise is the "hidden costs ... You find out you need a DLL for this, an API for that, a connection to other databases ..."*

MILLER: We're having the same issues. In early attempts to move away from the mainframe, we threw out the baby with the bathwater. In avoiding things we didn't like about the mainframe, we lost some of the things we did like, such as security and control. Now we're struggling to get that back in the new environment.

CW: If you had the chance, would you do client/server again the same way?

WOODS: You don't get to vote. Today, your company can't compete on technology or price alone. There's the need for breakthrough gains with very high rewards and risks. We used to spend years in operating systems conversions on the mainframe. Now we're trying to turn the whole company around in 18 months. We have to make breakthroughs in the way we do our business or perish.

KNELLINGER: If we were to do it again, I'd adopt more of the mainframe discipline and use more large servers ... and fewer of them.

CW: Did you attempt to cost-justify client/server projects?

MILLER: We try not to take technology and reason backward but take a business initiative and reason forward. We have to justify the costs not just from the IS standpoint but from the standpoint of the overall business initiative.

MOUNTZURIS: The only way client/server is going to be a success is if you change what you do. We were off by a couple of million dollars on our [return on investment on one project]. The bulk of it was time. It was defined as a nine-month project. After we went through all the training, it took 18 months.

WOODS: I have a simple rule that if you don't re-engineer the process, I don't automate it. Had we had that kind of rule back in the mainframe days, we might have been a lot more successful than we were. What we're doing differently now is not so much client/server, but having the processes drive the application.

Trials and tribulations, *page 97*

Whoa! I've got to see this for myself.

Send me a FREE copy of the TPC-B Benchmark Report.

Please answer the following:

1. My organization uses the following OS: (Check all that apply)

A ☐ AIX
B ☐ BSD
C ☐ HP-UX
D ☐ Interactive UNIX
E ☐ MS Windows NT
F ☐ NetWare
G ☐ OS/2
H ☐ SCO UNIX
J ☐ Sun OS/Solaris
K ☐ Ultrix
L ☐ UNIX SVR4
Z ☐ Other_____

2. What is your role in the purchasing decision? (Check one)

A ☐ Recommend
B ☐ Specify
C ☐ Approve
D ☐ Purchase
E ☐ Use

3. When do you plan to purchase? (Check one)

A ☐ Within 3 months
B ☐ Within 6 months
C ☐ Within the next year
D ☐ Information only

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone (_____) _____

Fax (_____) _____

NOVELL.

Drop this card in the mail or fax it to 1-818-365-1876.

CPW-74

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO 688 SAN FERNANDO, CA

POSTAGE WILL BE PAID BY ADDRESSEE

NOVELL.

DEPARTMENT 173
PO BOX 9000
SAN FERNANDO CA 91341-9978

It's not whether you win or lose, it's how pathetically slow and overpriced you make the other guys look.

It's not their fault, they wanted to be faster and less expensive than UnixWare.

But in the latest independent TPC-B* Benchmark tests, UnixWare achieved unprecedented results in price-performance, easily beating MS Windows NT, Solaris and SCO UNIX. It set a new record, making it the most cost-effective and high performance 32-bit application server in the world.

UnixWare

MS Windows NT

SCO UNIX

Solaris

UnixWare stretches budget dollars by delivering greater performance at a significantly lower cost.

If it were just fast, that would be one thing. But UnixWare also clearly demonstrated new highs in reliability and recoverability from system failure.

All this should not surprise you, since UnixWare is built on the latest version of UNIX System V Release 4, and was developed by the same dedicated group of overzealous engineers who created the original UNIX operating system. And UnixWare is versatile, supporting over 2,500 business-critical applications.

To celebrate this thrilling victory, we're slashing up to 70% off the list price on a conversion to UnixWare from other UNIX systems. And while you're off upgrading from slow and overpriced to number one, we'll be quietly working on the next world record. And the competition will be trying to recoup.

It's so hard to catch up, once you've fallen behind. Which is yet another reason why you should be using UnixWare now.

yes UnixWare

NOVELL.

The Past, Present, and Future of Network Computing.

Call 1-800-879-6168 for a FREE copy of the TPC-B Benchmark Report.

*UnixWare test results from March 28, 1994 for a single Pentium™ processor Compaq® Proliant™ 2000 Model 5/66-4200A running OracleWare™ System-UnixWare Edition. Results $433 tpsB based on 184.54 tpsB. Other results detailed in TPC-B Benchmark Report.

All company/product names are trademarks and/or registered trademarks of their respective companies

Look for us on all the major networks.

Word about PCs from Hewlett-Packard is getting around, and ratings are soaring. According to a recent CRN/Gallup survey, "Use of HP desktops in Fortune 1000 companies has doubled in the last year."[1]

And with good reason. Our broad range of PCs not only meets users' expectations for power and ease of use, it also answers the needs of a network manager. With built-in features like on-board networking, advanced security and asset tracking, HP PCs have what it takes to be top performers on virtually any network. And soon our expertise in network management will reach all the way to the desktop, as we continue to pioneer the development of DMI (Desktop Management Interface).

For more information or the name of your nearest HP dealer, call us today at 1-800-322-HPPC, Ext. 8567. And tune in to the network superstars.

HEWLETT® PACKARD

Give your other PCs something to look up to.

If you're connecting PCs to a network, scan this chart and you'll see it's time to hook up with HP.

STANDARD NETWORKING FEATURES	HP VECTRA XM2 PC	HP VECTRA M2 PC	COMPAQ DESKPRO/XE	DELL NETPLEX™
Advanced Bus Architecture	PCI	VL		
Integrated Networking Interface	32-bit	16-bit		
Integrated, multiprotocol Boot-ROM	X	X		
ISA Plug-n-Play Compliant	X	X	X	
Multilevel Security Features	X	X	X	X
Asset tracking	X	X	X	
PC tattooing	X	X	X	
Optional Desktop Management Software	X	X		
Bi-directional parallel port	X	X	X	X
Desktop Management Interface (DMI)[2]	X	X		

HP quality in value-priced PCs.

- *Intel 486SX, 486DX2 and DX4*
- *Chip upgrades to higher performance*
- *On-board accelerated local-bus video*
- *210-MB hard drive*[1]
- *4-MB RAM, expandable to 64-MB*
- *512 KB or 1 MB of Video RAM standard*
- *ISA Plug-n-Play compliant*
- *Desktop Power Management*
- *EPA Energy Star certified*

HP Vectra VL2

- *Local bus Fast-IDE hard disk interface**
- *1280 x 1024 video resolution**
- *Optional 128- or 256-KB cache memory**
- *Free three-year limited warranty for parts and labor*[2]

from
$1,099†

High-performance network-ready PCs in a slimline package.

- *Intel 25- and 33-MHz 486SX, 50- and 66-MHz 486DX2, upgradable to Pentium Overdrive*
- *Optional 128- or 256-KB second level cache*
- *170-MB, 14-ms Fast-IDE hard drive*[1]
- *32-bit Fast-IDE local-bus hard disk interface*
- *4- or 8-MB RAM, expandable to 96-MB*
- *Ultra VGA2 local-bus accelerated video supporting up to 1280 x 1024 resolution*

NEW!

HP Vectra N2

- *1 MB of video RAM standard, expandable to 2 MB*
- *Slimline package with two mass storage shelves and three ISA slots*
- *Optional integrated 10Base-T networking*
- *Multilevel security*
- *EPA Energy Star certified*
- *ISA Autoconfiguration utility (Plug-n-Play)*
- *Integrated Desktop Management Interface (DMI)*[3]
- *Free three-year limited warranty for parts and labor*[2]

from
$1,309†

High-performance PCs for the connected office.

- *Intel 33-MHz 486SX; 50- and 66-MHz 486DX2, 100-MHz DX4, upgradable to Pentium Overdrive*
- *Optional 128- or 256-KB second level cache*
- *Four mass storage shelves; four expansion slots*
- *One available 32-bit VL-bus slot*
- *210-MB, 14-ms Fast-IDE hard drive*[1]
- *32-bit Fast-IDE local-bus hard disk interface*
- *8-MB RAM, expandable to 96-MB*

NEW!

HP Vectra M2

- *Ultra VGA2 local-bus accelerated video supporting up to 1280 x 1024 resolution*
- *Optional integrated 10Base-T networking*
- *Systems Diagnostics Utility*
- *EPA Energy Star certified*
- *ISA Autoconfiguration utility (Plug-n-Play)*
- *Integrated Desktop Management Interface (DMI)*[3]
- *Free three-year limited warranty for parts and labor*[2]

from
$1,679†

Exceptional 486 performance for advanced business use.

- *Intel 50- and 66-MHz 486DX2, 100-MHz DX4, upgradable to Pentium Overdrive*
- *PCI architecture*
- *Standard 256-KB second level write-back cache*
- *Four mass storage shelves; four expansion slots*
- *Two available 32-bit PCI expansion slots*
- *210-MB, 14-ms Fast-IDE hard drive*[1]
- *32-bit PCI IDE hard disk interface*

NEW!

HP Vectra XM2

- *8-MB RAM, expandable to 96-MB*
- *PCI Integrated 64-bit S3 Vision-864 graphics accelerator supporting up to 1280 x 1024 resolution*
- *Optional PCI Integrated 32-bit 10Base-T networking*
- *Integrated Desktop Management Interface (DMI)*[3]
- *EPA Energy Star certified*
- *Free three-year limited warranty for parts and labor*[2]

from
$2,239†

The ultimate PC for advanced business and technical applications.

- *Intel 90-MHz Pentium Processor*
- *Second processor socket for MP Spec 1.1 multiprocessing*
- *Standard 256-KB second level asynchronous or burst asynchronous write-back cache*
- *PCI architecture*
- *Four mass storage shelves (three front accessible); five expansion slots*
- *Two available 32-bit PCI expansion slots*
- *270-MB, 12-ms Fast SCSI-2 hard drive*[1]

NEW!

HP Vectra XU

- *Integrated 32-bit PCI SCSI-2 interface*
- *PCI integrated 64-bit S3 Vision-864 graphics with 1280 x 1024 resolution or PCI MGA Ultima Plus graphics with up to 1600 x 1200 resolution*
- *32-bit PCI IDE hard disk interface*
- *8 or 16 MB of RAM, expandable to 256 MB*
- *PCI Integrated 32-bit 10Base-T networking*
- *Integrated Desktop Management Interface (DMI)*[3]
- *Free three-year limited warranty for parts and labor*[2]

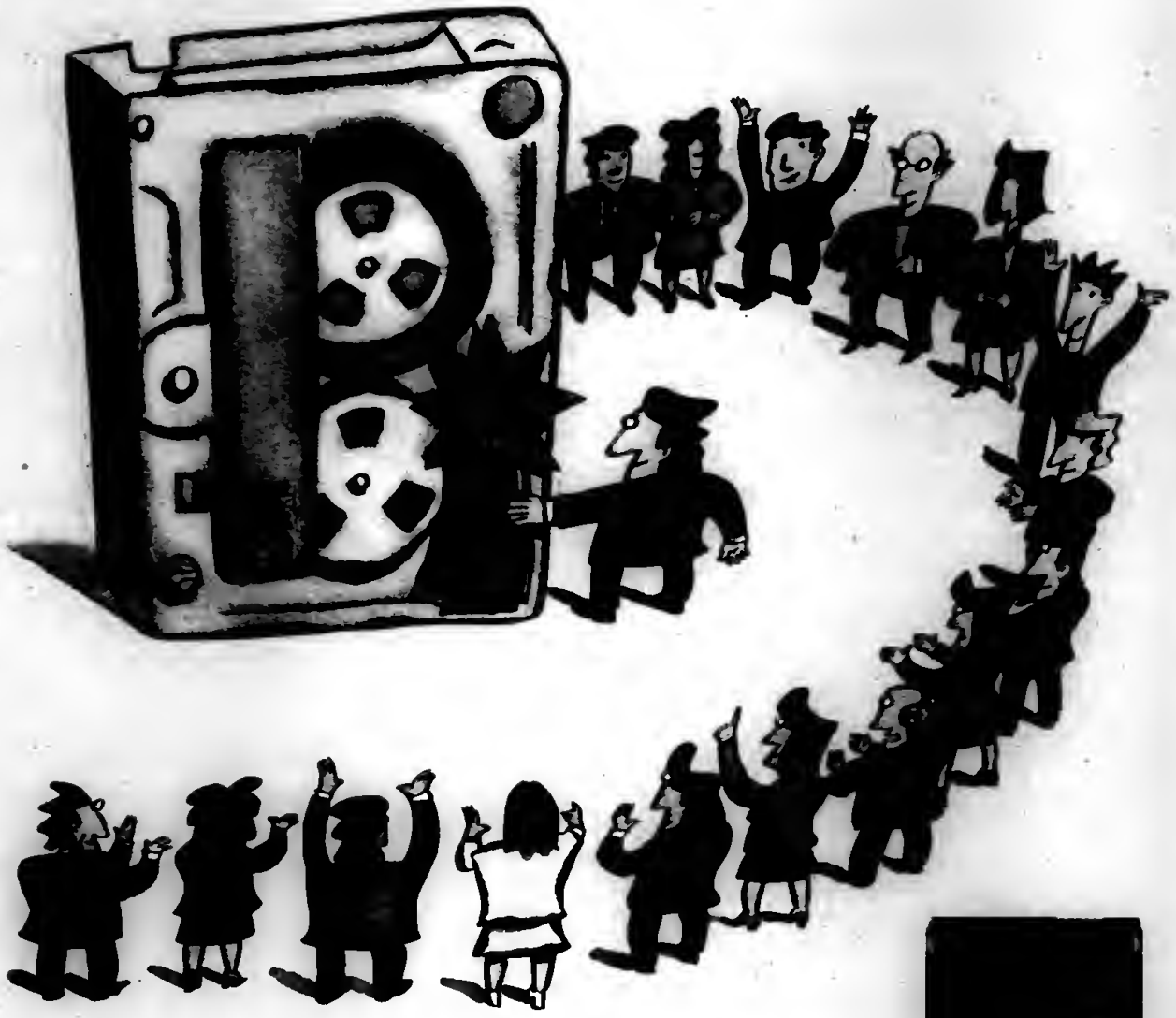
from
$3,749†

intel inside

yes NetWare Tested and Approved

All HP Vectra PCs come with MS-DOS® 6.2 and MS Windows for Workgroups 3.11 pre-installed; HP mouse and keyboard included. *Feature included with some models. †U.S. list price, dealer prices may vary. Monitor not included. [1]Other capacities available. [2]First year on-site 24-hour service. Second and third year return to dealer. [3]Available 10/1/94. ‡With permission CRN/Benchmark. MS-DOS is a U.S. registered trademark and Windows is a trademark of Microsoft Corporation. Pentium and the Intel Inside logo are U.S. trademarks of Intel Corporation. PPG487 ©1994 Hewlett-Packard Company

Rated number one in reliability by people who expect nothing less.



3M quarter-inch cartridges are the most popular way for businesses to backup and store critical data. Preferred seven to one over other brands–from 40 mb to over 5 gb, 3M brand quarter-inch cartridges are on the job day and night in over ten million drives. Durable, proven and rated #1 in reliability. That's why more businesses protect important information on 3M brand data storage products than any other brand in the world. For more information and your free "Data Security Handbook" call 1-800-888-1889, ext. 1502.

3M quarter-inch cartridges require compatible drives.
Preference and reliability ratings based on independent research.
© 3M 1994

3M *Reliability*

Trials and Tribulations

CONTINUED FROM PAGE 92

For example, in product data management, we're going to spend $67 million over five years. Forty million dollars of that is in the operating units, and the bulk of that is people costs for reeducation, reprocessing and redesigning applications.

KNELLINGER: We ignore the fact that client/server is an enabling technology, and it's hard to quantify that. I call it the *Field of Dreams* thing: If you build it, they will come. We've found in some places where we've implemented client/server [that] it's generated a whole cadre of ideas for business improvement. That doesn't show up in a business case.

CW: Is client/server saving you money?

MOUNTZURIS: Some projects have. We developed a budget and [profit and loss] system that used to cost $120,000 a year. Now it costs about $2,000. The system took 13 months to develop on a mainframe. It took us three months on a PC. However, other projects don't give you paybacks before 24 months.

MILLER: We have client/server systems that have saved us money, but I'm not sure they wouldn't have saved us money on the mainframe.

What client/server has done is gone beyond putting data into a system to giving people data and the ability to analyze it. People do things they couldn't have done before because they didn't have access to the information.

Ian Miller: *"Our mainframe is growing, not rotting on the vine"*

CW: But how do you quantify that?

WOODS: Competitive survival. As a global company, we're moving to worldwide engineering and manufacturing. Our engineering staff may be in southern California, our manufacturing staff in Tucson, our quality staff in Washington and our field office in Brussels. Distributed computing environment will allow for this. We couldn't have done it without this enabling technology.

CW: How did you handle the staff changes that are required within IS?

MOUNTZURIS: We attempted to train the individuals who were more mainframe-oriented. Some people did not want to change at all. We went through a major reorganization of that department, hired professionals who were skilled in [Microsoft's] Visual Basic, C++, PowerBuilder, Sybase and client/server. It costs more, but we have very high skill sets. We want to do more with fewer, very skilled people.

CW: You've cut a lot of people too, then?

MOUNTZURIS: Yes.

MILLER: Our mainframe is growing, not rotting on the vine. We have clinical work on the mainframe, a lot of manufacturing planning, financials. People who want to work in that environment aren't going to lack for things to do.

WOODS: I have the opposite situation. Three years ago we employed 800 people in the mainframe area. Today it's about 260. The people who believe in lifelong learning are still with us, but a lot of people couldn't make this change, not just in [information technology] but in every aspect of the business.

KNELLINGER: We took a 45% cut in our IS staff last summer. To offset that we doubled the amount we were spending on training. Mainframe approaches built up a lot of bureaucracy in time spent haggling over requirements. Client/server brings iterative development to bear rather than the customer handing off written requirements. One good way to convert people from mainframe to client/server thinking is to show them the want ads in the Sunday paper.

MOUNTZURIS: Terminating people is the easy way out. You have to give them the opportunity to learn a technology, to make them skillful enough that they'll be able to find a job on the market.

CW: What percentage of your people, realistically, will not make the transition?

WOODS: You know fairly soon who the adapters are. People who didn't adapt [at Hughes Aircraft] were like deer in the headlights. We had many people who froze at object-oriented and client/server technology. [The problem is that] people's fear made them less productive. We probably had 50% of the staff who couldn't change. It's very difficult. I don't think any of us who've been in [information technology] for a long time were trained in the human management issues.

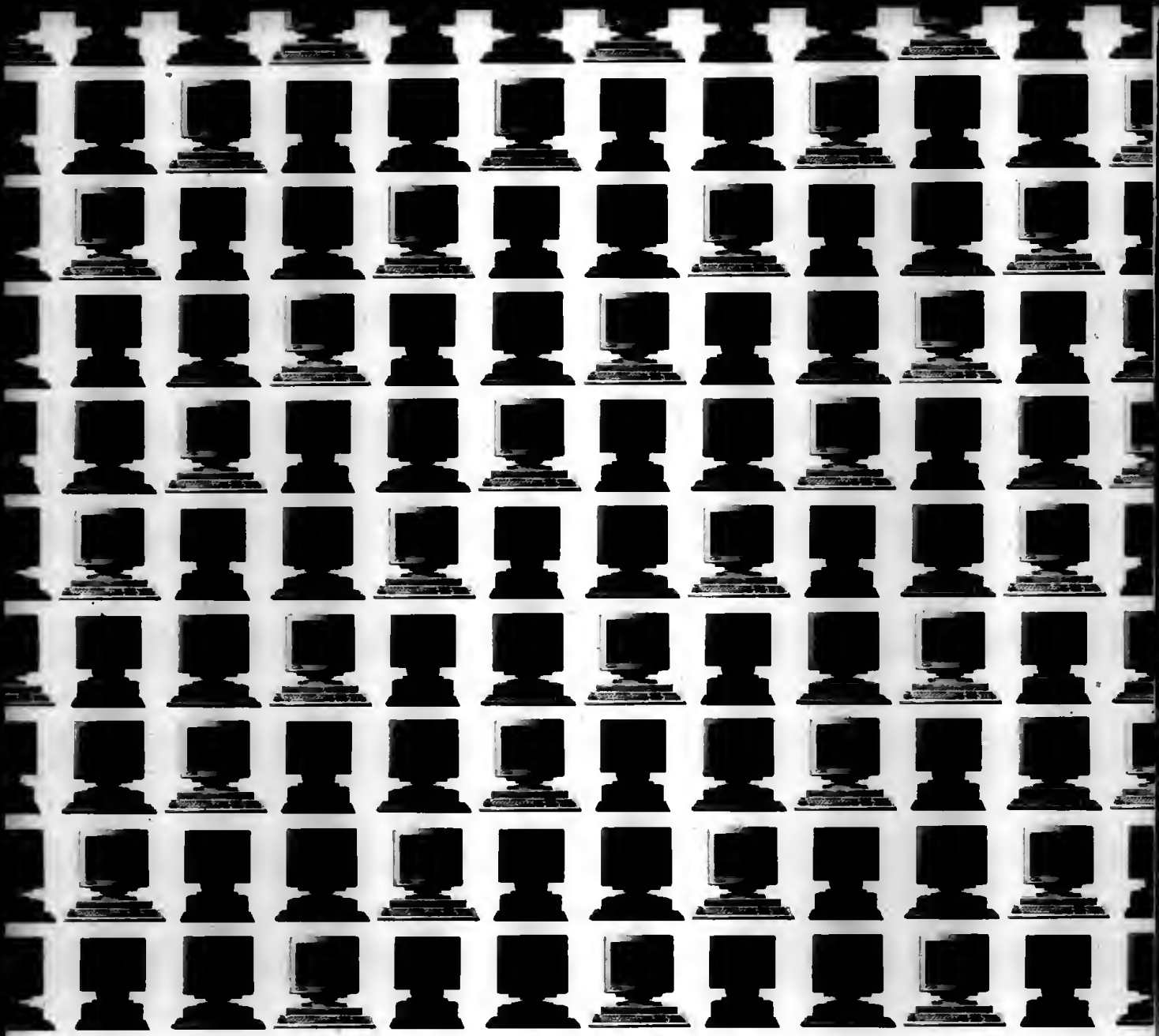
Mike Knellinger: *"We've found in some places [that implementing client/server] has generated a whole cadre of ideas for business improvement"*

CW: Can you name one product you couldn't do without in the move to client/server?

WOODS: I have 500 LANs to control, and you can't do that without effective systems management. The Tivoli suite of network and operations management software allows us to do systems and network operations and help desk tracking that are similar to what we had in the mainframe environment. I've mentioned some [independent software vendors], Sherpa being the most significant.

KNELLINGER: PowerBuilder allowed us to do some fairly customized development. The second product was one from Scopus [Technology] that gave us an off-the-shelf way to do global problem management within the company. It attacked the problem of the heterogeneous desktop environment we had.

MOUNTZURIS: The most critical is system management tools. Because we're a heavy PowerBuilder shop, we invested in a product [designed to work with PowerBuilder] called PowerTool from PowerCerv in Tampa, Fla. It allows us to develop object-oriented code more efficiently. ■



We've Just Created Thousands Of Reasons Why It's A Great Time To Buy A Compaq Desktop.

And they're all available now. We've sped up production of our entire line of Compaq desktops. And we've made them more affordable than ever. So there's never been a better time to buy a Compaq ProLinea, Deskpro XE or Deskpro XL. Or Compaq monitors to go with them. For more information, or for the name of a reseller near you, call 1-800-739-4343. Because there's no reason to be without a Compaq desktop. **COMPAQ**

© 1994 Compaq Computer Corporation. All rights reserved. Compaq, Deskpro and ProLinea registered U.S. Patent and Trademark Office

Computer Careers

Wires without

By Bronwyn Fryer

It's coming, so you might as well learn the ropes. Rapidly improving technology has made wireless networks a little easier to implement, but analysts say most IS staffs are not prepared for the task.

Don't expect to find Cheryl Currid at her desk answering the dozens of electronic-mail messages she receives daily. An enthusiastic user of her wireless modem, the president of Currid and Co. in Houston prefers messaging from the road. "I'm totally addicted to doing my E-mail in taxicabs," Currid says. "It's very stable and works very well with short transmissions."

She's not alone. In the world outside the climate-controlled information systems environment — where the company's proverbial rubber meets the road — sales, service and support representatives must turn on a dime to retain customer satisfaction.

To keep field forces nimble, more organizations are providing users with wireless devices ranging from long-established items such as cellular phones and pagers to technologies involving more brain power, such as personal digital assistants, laptops and palmtops equipped with specialized mobile radio modems.

The use of such wireless networks is expanding rapidly. Last year alone, United Parcel Service, Inc. installed two-way wireless communications technology on 60,000 of its trucks. Wireless providers also cite a growing number of converts: ARDIS claims 35,000 current users, and RAM Mobile Data claims 12,000 users. By 1996, subscribers to such networks are expected to grow to 22 million.

The IS hurdle

Unfortunately, most IS staffs are ill-prepared to deal with the wireless onslaught, says Ira Brodsky, president of DataComm Research Corp. in Wilmette, Ill. "Many IS departments get forced into this because Operations says, 'We have to have this. It's your job to figure it out.'"

Although the adoption of wireless technology is seen as increasingly critical, IS can find itself sandbagged by the complex new technology. If you're thrown to the lions, the issues that will affect you most include the following:

▶ **Planning:** Many companies are still undergoing sticker shock over the cost of wired LANs. A survey by Business Research Group in Newton, Mass., indicates that cost-justifying a wireless network — including installing a communications server and a database server, contracting with a service carrier and purchasing wireless modems for many users — can be tricky.

In addition, IS managers must think differently, Currid says. "Dealing with wireless is not a standard IS job. We're talking about empowering, enabling technology and designer appliances that people carry with them."

To that end, she argues, wireless technology broadens IS responsibilities. IS managers must be more nurturing and have an even more detailed understanding of how the end user works than when setting up the average LAN.

In the expanding world of wireless, IS managers must also wrestle with a mind-boggling array of choices when designing a wireless communications system. "IS must choose among a host of new technologies and players, and a novice can't sort them out," Brodsky says. "Everyone worries about betting on the wrong horse."

▶ **Monitoring the network:** In the complex world of wireless, where users are in a variety of unknown locations and pop in and out of the network, IS professionals must deal with issues ranging from quality changes to delays. "In a wired LAN, you can monitor users easily. In a mobile environment, you don't know where they are," Brodsky says.

This issue is complicated by a lack of off-the-shelf network management tools for wireless networks, though some ven-

Wireless, *page 101*

In the works

If your company hasn't gone wireless yet, a shift to the emerging technology may be in the cards. Technologies that many companies are at least considering include the following:

Wireless data network types

	Considering	Planning
Wireless LAN	57%	42%
Cellular	49%	36%
Paging	28%	20%
Specialized Mobile Radio	26%	18%
Wireless packet	23%	14%
Satellite/VSAT	22%	18%
Other	6%	4%

Base: 171 respondents, multiple response allowed
Source: Business Research Group, Boston, Mass.

SYSTEMS PROGRAMMING ADMINISTRATOR

($1,388.34 - $2,364.34 Bi-Weekly) A bachelor's degree from an accredited college or university and five years of experience in computer systems analysis and/or computer programming, three years of which must have been in systems programming. **Position number - 63086. Position location - Tallahassee.**

Experience in directing software engineering and data administration activities, knowledge of Information System Development Methodologies, at least 6 years of experience in project management, quality assurance development and maintenance of automated systems; experience in CASE tools and data repositories.

Submit state of Florida employment application to: Jo Moore, HRS Technology Centre, 1940 North Monroe Street, Tallahassee, FL 32399-0710, (904) 487-8169, Fax (904) 487-6799, DEADLINE: 5 P.M. September 29, 1994. EEO/AA Employer

CONSULTANTS

- All Technologies
- Nationwide Openings
- Salaried or Project Basis
- 2+ Years Experience

Send/Fax resume to:
Analysts International Corp.
P.O. Box 39612
Minneapolis, MN 55439
Fax (612) 897-4693

INFORMATION SYSTEMS PROFESSIONALS

Unisys Corporation provides the mission-critical business solutions relied upon by more than 60,000 global organizations in 100 countries. A services-led, world class solutions company, we specialize in computer-based networked information systems, software & related services that flourish in transaction-intensive environments. The following exceptional opportunities now exist for talented information systems professionals possessing related degrees & excellent communication skills:

APS Consultants
Lansing, MI Area

3-4 individuals needed to assist in establishing the development environment for a large client/server, statewide telecommunication network, Federal Certified Family Assistance Management Information System (FAMIS). Requires 5-8 yrs data processing exp with 2+ yrs in full-life cycle CASE tool development & development of complex systems using APS.

Claims Processing System Consultant
Salt Lake City, UT Area

Aid in all end user requirements development & validation. Requires general health care knowledge with detailed expertise in insurance claims processing. Director/Manager level of claims processing operation or systems development expertise. Comprehensive knowledge of systems implementation or conversion to a new claims processing application essential.

LINC II Technical Expert
Salt Lake City, UT Area

Assist in the development of a systems technical architecture. Requires 5-7 yrs exp with LINC II Internals, LDAIII, LINC II Systems Development, LINC II Performance & LINC II Client/Server Implementations.

Unisys offers the outstanding rewards that you would expect from a company of our stature. Interested applicants should forward resume, indicating position of interest, to: UNISYS CORPORATION, Attn: Technical Recruiter, 3199 Pilot Knob Rd., Mail Stop FIK03, Eagan, MN 55121-1362. FAX (612) 687-3306. We are an equal opportunity/affirmative action employer committed to work force diversity.

UNISYS

Grow With Us.

Technology Consulting, Inc. is a dynamic and rapidly growing Software Development Firm with challenging assignments. We are a leader in application outsourcing. Current client projects and our regional development center require the following skills:

CLIENT SERVER-C,C++, Smalltalk, Visual Basic/C++, MS/Access, Oracle, SQL*FORMS, Sybase, Powerbuilder, Lotus Notes, Gupta, SQL Windows SDK NT, Fespro, Patheworks, Progress

AS/400-RPG/400, COBOL

MAINFRAME-COBOL, CICS, IMS DB/DC, DB2, Natural, Construct, INFORMIX, EDI

TCI offers competitive salaries, attractive benefits, and relocation assistance. For consideration, send resume or call: **502-589-3110.**

TCI TECHNOLOGY CONSULTING INC.
1820 Meidinger Tower, Louisville, KY 40202 FAX 502-589-3107

CONSULTING

Contract Solutions is offering long-term consulting opportunities locally and throughout the United States. Most positions pay between $80,000-$130,000 per year.

- UNIFACE 4GL
- ULTRIX SYS. ADMIN.
- DB2, CICS, COBOL
- AS/400, COBOL OR RPG
- VAX, C, SAP
- PROGRESS PROGRAMMER
- ALPHA, OSF-1, C
- ORACLE V.7 FORMS 4.0
- VMS, SYS. ADMIN.
- OSF-1 SYS. ADMIN.
- IMS DB/DC, COBOL
- SUN, X, GUI
- VISUAL C++
- SUN SYS. ADMIN.
- MS WINDOWS, MS ACCESS
- VISUAL BASIC
- NATURAL ADABAS
- IEF DATAMODELING
- SUNOS KERNAL, DRIVER
- C++, OLE
- ALPHA AXP/OSF1, C
- ORACLE FINANCIALS R.10
- MAC, C++, GUI
- VMS, RDB, C, DECFORMS
- MVS, CSP, DB2
- MS WINDOWS, MFC

CONTRACT SOLUTIONS

Two Kerwaydin Drive
Salem, NH 03079-4875
800-998-csi 1 (2741)
603-893-6776
FAX: 603-893-4208
email cxmat@mv.mv.com

"The Registry's specialized resource team understood my expertise and quickly found the right assignment for me."

Dillon Banfield, Software Consultant

As a leading full-service information technology consulting firm, The Registry provides clients with a variety of business solutions. For two years running, we've been rated as one of the fastest-growing companies in the US by INC. Magazine — and 1994 will be no exception!

Regional Offices:

Atlanta, GA
Boston, MA
Charlotte, NC
Chicago, IL
Cleveland, OH
Dallas, TX
Denver, CO
Durham, NC
Ft. Lauderdale, FL
Greensboro, NC
McLean, VA
Newton, MA
New York, NY
Rye Brook, NY
Richmond, VA
Rosemont, IL
San Francisco, CA
Seattle, WA

Our national specialized recruiting program has set The Registry apart from our competitors. By fully understanding your technical expertise and the project needs of our clients, we successfully find the right consulting opportunity -- for you.

Call our specialists today for short- and long-term projects nationwide:

- **IBM Mainframe Development** - Mike Forbes
- **Databases** - John Byrne
- **Desktop Computing** - Mike Forbes
- **Networks & Communications** - John Byrne

In addition to excellent weekly compensation, we provide a 401(k) plan and healthcare options.

Toll-Free: **1-800-248-9119**
Fax: **1-617-527-8805**

Multiple Opportunities Nationwide

- **UNIX/C or C++/OOP (new & expanded)**
- **Visual Basic, MS-Access or Visual C++**
- **Oracle 6/7, Forms 3/4 developers, All platforms**
- **UNIX/AIX System Administrators**
- **VAX / COBOL or C/DECFORMS**
- **Adabas/Natural**
- **DB2/CICS/COBOL (multiple locations)**

Contact: Mike Forbes (617) 527-9119
Toll-Free: (800) 248-9119 or FAX: (617) 527-8805

The Registry
189 Wells Avenue
Newton, MA 02159
Member NACCB

DATA PROCESSING

We are a major international manufacturer of agricultural and construction equipment based in Racine, WI. Excellent opportunities are available in our Information Systems Group for experienced professionals including.

UNIX SYSTEM ADMINISTRATOR

3+ years experience administering Sun and HP UNIX systems. "C" programming and K-shell coding experience required.

MVS/ESA PERFORMANCE MANAGEMENT & CAPACITY PLANNING ANALYST

4+ years in the following areas: MVS/ESA, SMF, RMF, Windows, SAS coding techniques, capacity planning and performance reporting, knowledge of HIPERSPACE, VLF, DLF facilities, IPS/ICS/OPT tuning parameters.

NETWORK SOFTWARE PROGRAMMER

3+ years experience in installation, maintenance, and integration of network software in the UNIX, LAN, and IBM mainframe environments. TCP/IP and "C" programming skills required.

DATA BASE CONSULTANT

3+ years data base administration experience supporting large scale application development projects using Sybase. Demonstrated data base analysis, design and production support skills in the client/server environment required. Powerbuilder experience and mainframe data base management experience in IDMS and IMS desired.

DATA ADMINISTRATOR

5+ years experience coordinating process modeling, data modeling, and JAD methodologies across large scale application development projects. Demonstrated skills in data analysis, design, and administration, project management, and facilitating are required. Master's degree preferred

As a well known and highly respected company, we will reward your efforts with an excellent compensation and benefits package, a stimulating career environment and ample opportunity for professional development. Females and minorities are encouraged to apply. For prompt consideration, forward your confidential resume to.

CASE CORPORATION
5729 Washington Ave.
Racine, WI 53406
ATTN: Luann Hageman,
Human Resources

Equal Opportunity Employer M/F/D/V

case

Established in 1986, William J. Kelley & Company, Inc. is one of the leading providers of technical consulting services in the Boston, New York, San Mateo, CA and Tampa Bay areas. We are growing fast and seeking talented professionals to fill key positions in our telecommunications software and financial consultancy.

INFORMATION SYSTEMS CONSULTANTS

Positions are salaried with benefits including health insurance, paid holidays, vacation time and 401K plan.

Qualifications: Candidates must have a Bachelor or Master's Degree and experience in the following disciplines: IBM 3090 skills including PL/1, COBOL, COBOL II, SQL, OS/MBS, TSO/SPP, IMS, DB2 and SAS; client/server skills including C, C++, UNIX, AIX, PowerBuilder, PC Express, Pilot Software, Lotus Notes and COBOL Workbench.

To apply, please send your resume including salary history/salary requirements to: Erika Kelley, William J. Kelley & Company, Inc., 303 Congress Street, Boston, MA 02210 or fax: 617-330-9365. No phone calls please.

An equal opportunity/affirmative action employer

William J. Kelley & Company, Inc.

SAUDI BUSINESS MACHINES (IBM), the General Manager of the Eastern Province invites applications for the following positions

COMPUTER CONSULTANTS

Senior Consultants & Analysts with COBOL, IMS, DB2, TELON experience to develop, maintain or enhance business or engineering systems software. Desirable Experience, MicroFocus and ADW (Knowledgeware).

Senior ADW (Knowledgeware) Consultant with at least ten (10) years solid experience.

Consultants & Analysts in client/server applications development with experience in **PowerBuilder** essential

Contract conditions are excellent including tax free salaries, free housing, expat/repat tickets, medical coverage, local transportation and completion bonus.

For early consideration please fax your CV at the earliest to:

Industrial Resources
Fax 0011-966-3-894-6955
P.O. Box 876, Al Khobar 31952
Kingdom of Saudi Arabia

Telecommunications Engineer, 40hrs/wk., 9am - 5pm, $47,840/year. Design, installation and testing of a wide range of telecommunication systems geared toward the Information Super Highway. Projects include: video teleconferencing, Integrated Systems Digital Network (ISDN) switches; ethernet over ISDN, CD quality voice over copper wire; network management; power line carrier communication. Tools: ISDN switches; Fiber optic media with SONet; MS-DOS; UNIX, AutoCAD; Designer; ATT, Telesis and Harris proprietary software. M.S. in Electrical Engineering as well as two years experience in the job offered or two years experience in telecommunications required. Previous experience must include telecommunications system design, configuration and testing. Graduate education must include one project on fiber optics. Submit resume to: Job Service of Florida, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater, FL 34618-4080. Re: Job Order number FL-1103190.

Programmer/Analyst (Will travel to Orlando and Tampa, FL client sites) Design, develop, code, implement and maintain commercial and financial applications systems using RPG/400 in an IBM AS/400 environment. Bachelor's Degree in Comp. Sci, Engin., or Math + 2 yrs exper in job 40 hrs/wk, 8:30 a.m. to 5:00 p.m., $37,000 per year. Send resume to: Job Service of Florida, 3421 Lawton Rd., Orlando, FL 32803-2999, RE: Job Order No. FL-1103030

ENGINEER Sthwre. Engr needed to design, develop, support, & maintain sthwre for applcatns. in semiconductr manfactrng engg anlysis, & office atomation Anlyz. & develp system reqt's for applcatns., modeling, usr interfac, & defbse design reqt's, prfmance., reliblity & scalblity. Design, code, test system., prfrm system integrtion. Synthesiz design using new technqlies, while maintaing compatblity w/existing systms. Suppt., incldng enhncmnts. to a rule-based Artificial Intlligncs application, that detects potntial commnation probs caused by chngs. in the semiconductr process flow. Prepre presntations of sytm design present systms. demos to customers. prepre user gids for applications., & doc. sytm. capabilities. Evaluat new technlgies for more efficent sthwre. dvelpmnt., incldng anlyzing, 4th gernsion grphcal usr interfaces dvelpmnt. tools, rlational & object-orentd database products & prgmming tools & sthwre commnication protocols. Prfrm reqt's, regression., & functionlity testing, & troubleshooting. Maintin existing sthwre by providing on-call supprt., upgrds, & system enhncmnts. Reqt's: MS in Compter Science., Compter or Electr Engg. + 1 yr. experienc in the job offerd. or as a programmer. Othr reqt's: ABILTY TO prgrm. OS scripts, of command procedrs. in VAX/VMS, UNIX SVR4, & MS-DOS/WIN OS environmnts, design., develp., & test of applcatn & sytms levl using C, C++, BASIC, FORTRAN, Pascal, LISP, prolog & Smalltalk, design & develp grphical user interfaces KNOWLDG OF relational & object-oriented databases., & Microsft. Windows sthwr suites. Will supervise 0 employes. Min. hrs are 40/wk. Salry is $3,785/mo. Job location: Hillsboro, OR. Qualifd applcnts. send rsm to: Oregon Employment Dept., AEC Office, Attn: Job Order #5660771, 875 Union St. NE, Rm. 201, Salem, OR 97311. Applcnts. must have legal authrty. to permanently wrk. in the U.S. The co. is an equal opportunity employer & fully supports affirmtive action prctics.

Computerworld recruitment advertising works!

That's because more computer professionals read more recruitment advertisements in *Computerworld* than in any other newspaper. For more information or to place your advertisement, call **Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).**

COMPUTERWORLD

Weekly, Regional, National. And it works!

Continued from page 99

dors can provide status and updates and logging services. "That's an area that needs to mature," says Laura Battafarano, mobile computing consultant at KPMG Peat Marwick in Radnor, Pa. In most cases where wireless is currently installed, network management tools must be custom-built, but expertise in this area is still limited.

▶ **Managing user expectations**: IS staffers must warn users that "going wireless" is not the same as working in the office.

For example, because current wireless products are slow due to low bandwidth, "users who are accustomed to having instant live access to data may become frustrated by having to deal with 1,200 bit/sec. transmission rates," Brodsky says. For that reason, only a few applications are as yet really appropriate for wireless.

"Right now, wireless is great for transmitting short textual information under 10K bytes," Currid says. "But you can't send a 2M- to 3M-byte PowerPoint piece."

In addition, wireless is not available in every area. IS managers who are early adopters of wireless must let users in out-of-the-way locations know that coverage may go away.

Finally, the equipment is bulkier than most cellular phones or pagers. Weighing in at around 1½ pounds, "the radios are fairly big and bulky like a double VCR tape," Currid says. "Executives may not want to carry all that gear."

▶ **Application development**: Applications for wireless devices must be modified to operate over low bandwidth. "You can't just take an application and throw it in the field," Brodsky says. "You must know how to filter the key information, and it involves more than developing a new user interface."

First, IS professionals must learn how transmission over infrared or packet radio works if the wireless system is used for an application such as E-mail. Remote user machines must be carefully installed. In addition, application interfaces must be tailored. Instead of developing a new interface, developers most find ways of actually stripping down applications to their barest form, such as automatic stripping of the formatting in a word processing document. They may also have to create Dynamic Data Exchange or Object Linking and Embedding links between applications and wireless devices. "There's a lot more development effort in wireless than a lot of people anticipate," Brodsky notes.

▶ **Support**: Because expertise in the field of wireless communications is still comparatively rare, most organizations find they must put extra effort into internal training. In addition, most opt to outsource support to the vendor or a consulting firm. However, "unless the wireless network is to be used on a 24-hour-a-day, 7-day-per-week basis, there is usually no need to provide round-the-clock support," Currid says.

Battafarano adds that most of her clients farm out a portion of their support tasks but also custom develop applications for the communications server, depending on the application.

Worth the effort

Despite such needs, Currid says instituting a wireless technology plan is "not the technological nightmare" it appears to be because the technology and offerings are improving rapidly.

In the long run, she adds, those who learn to manage wireless networks will help their career. "Wireless is a technology that most people will want, and it's part of everyone's future," she notes. "It's an important specialty that's a good one to go after." ■

Fryer is a free-lance writer in Boulder Creek, Calif.

Walgreen goes wireless

When it comes to wireless communications, Duane Stuenkel, IS manager of corporate transportation at Walgreen Co., admits there's more to it than meets the eye.

Even with heavy maintenance of Walgreen's wireless computer system outsourced to the tune of about $5,000 annually, Stuenkel wrote several customized programs and produced a summary database himself. "There's a longer learning curve in preparing for wireless solutions," Stuenkel says. "Programming applications for wireless isn't just learning one language, but many different ones."

During the past year, the Deerfield, Ill., company has implemented a wireless system that provides fleet dispatch and management to the company's 100 delivery trucks in 34 states.

The system, consisting of a computer, bar-code scanner, cellular phone, modem and portable printer aboard each delivery truck, allows corporate headquarters to locate trucks and track inventory and worker hours between distribution centers and stores.

Initial implementation cost roughly $4,000 per truck and 1½ years. "That's more time up-front than the usual programming project," Stuenkel says.

Because implementation required more muscle than Walgreen's in-house IS staff could provide, the firm chose to outsource all custom hardware development, ongoing maintenance and a big chunk of technical support.

CONSULTANTS
Immediate Interviews
MAINFRAME
DB2/CICS • BAL • ADSO
DB2 or CICS • IDMS • IMS
Natural 2 • Internals • VM
Tandem • Ramis • AS 400
DASD • CSP • HPS
SQL/DS DBA • APS • PL1
DB2 6000 • JD Edwards • Swift
CLIENT SERVER
Visual C++ • VAX/RDB • Excel
Powerbuilder • Informix • Banyan
Peoplesoft • Novell • Paradox
Teknecron • Oracle • Unix
Lan/Wan • Sybase • Smalltalk
Uniface • Access • C++
Sys/Admins • TCP/IP • Motif
Windows • Testing • MF/Cobol
Windows NT • Vis Basic • OLE 2.0
Rohn Rogers Consulting
1212 6th Ave, 9th Fl, NY, 10036
800-338-5995 212-921-1319
Fax 212-302-4363

PROGRAMMER ANALYSTS
UNIX/TCP/IP ARCHITECT
OMNI7/SYBASE
SYBASE/UNIX/OPEN CLIENT
CICS COMMAND LEVEL/BAL
QUALITY ASSURANCE
AS400/LANSA or SYNON
BUSINESS OBJECTS 3.0
UNIFACE/SYBASE/C/UNIX
CICS/DB2/TELON
CC:MAIL/LOTUS NOTES
EXCHANGE FACILITY
ALLEGIANCE
NACCB MEMBER
Call Sun or anytime:
(212) 421-7255
Send res or FAX (212) 421-0517
Attention: Maryann Bruno
1 Penn Plaza,
Ste 100, NYC 10119

DATA AID INC
PEOPLE WHO KNOW COMPUTERS
We seek qualified and talented programmer/analysts for the following positions available in Birmingham or Atlanta.
• TANDEM • GUPTA
• BOOLE & BABBAGE • DB2
• TSO/ISPF • Business MOTIF
• POWERBUILDER • VISUAL BASIC
• UNIX, C, C++ • COBOL, IMS DB/DC
• JD EDWARDS/AS400 • PEOPLESOFT/Payroll
• Telephone Experience
• UNIX w/ LAN/WAN or CLIENT-SERVER • VAX
Send or fax resume and salary history to:
Data Aid, Inc
1855 Data Drive
Birmingham, AL 35244
Attention: Recruiter C
800-987-8878
205-987-8878
Fax: 205-987-1014

SOFTWARE ENGINEER: 40 hrs./wk. 8am-5pm, $44,500/yr. Perform design, coding and testing of s/w application system on IBM 3090 mainframe utilizing MVS/ESA, DB2, CICS, COBOL, JCL, VSAM and REXX software. Req: Bachelor's degree in Computer Science, 3 yrs. expr. in job offered or 3 yrs. expr. as Assistant Systems Analyst/Systems Analyst/Programmer/Trainee. Work experience in developing s/w applications on IBM 3090 mainframe utilizing DB2, VSAM, REXX, COBOL, JCL and CICS. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 100194

Senior Programmer/Analysts
100% company paid health, dental & disability. Must have 3+ years of experience.
#1- IMS DB/DC, TELON, COBOL II.
#2- AS/400 System Administrator/Communications Specialist with good PC background.
Springfield, Illinois location. Reply MSI, PO Box 670, Springfield, IL 62705

PRODATA INC. Portland, OR Salt Lake City, UT
As One of the West's premier IS Consulting Service firms, We Offer:
• Career Growth • Excellent Compensation • Loaded Perks • Continuing Education • The Challenge of Diversity • Fortune 500 Clientele • Outstanding "Quality of Life" • A Decade of Sustained Growth • Relocation Assistance
Needed: COBOL, CICS, TSO, VSAM, IDMS/ADSO, IMS or DB2; for major development!
Other: OOP/GUI (Powerbuilder, Visualbasic, Windows/SQL, C++), RPG/SYNON, CASE, Progress, ORACLE (FORM 3.0 w/C & UNIX), INFORMIX, VMS/RMS
PRODATA
4800 S.W. Macadam
Suite 309
Portland, OR 97201
(PH) 503 223 3508
FAX 503 223 7918
PRODATA
1100 E. 6600 S.
Suite 200
Salt Lake City, UT 84121
(PH) 801 266-6138
FAX 801 266 0069

Programmer/Analyst (Houston, TX area client site). Analyze design develop code test maintain and document programs for commercial and financial applications systems, using RPG in an IBM midrange environment. Bachelor's degree in Comp. Sci., Math., Engin. or Bus. Admin., and 1 yr exp in job req. Will accept 3 years of experience in lieu of Bachelor's degree and 1 yr exp. Development work must include at least 1 year of RPG/400 programming experience on the AS/400. 40 hrs/wk. 8:30-5, $37,500/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O. #TX7211733. Ad Paid by an Equal Opportunity Employer

SOFTWARE ENGINEER: 40 hrs./wk. 8am-5pm, $51,400/yr. Design, coding & testing of Input/Output Process (IOP) s/w programs on a TANDEM mainframe computer under GUARDIAN operating system, utilizing TAL & C as programming languages. Write IOP's to facilitate testing of the Token-Ring LAN connectivity. Require Bachelor's degree in Comptr Science, Electronics Engrng, 6 yrs exper in job offered or 6 yrs. exper as Systems Analyst/Programmer/Assistant Consultant/Consultant. Work experience with Token Ring LANs & writing IOPs on TANDEM mainframe with GUARDIAN operating system, utilizing TAL and C. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 103594

SAUDI ARABIA
Information Engineering Specialists
Team Leaders
&
Application Analysts
for a large banking project
Essential:
Information Engineering Methodology
Relational Database
IBM- Mainframe
Desirable:
IEF; CICS/DB2
Banking Experience
Expatriate Experience
Send Resume, References and Salary required at: P.O. Box 53175, Riyadh 11583, Saudi Arabia

TANDEM
COBOL PATHWAY TAL SCOBOL C SQL X.25
STRATUS
PL1 COBOL C ON/2
MUMPS UNIX
SUN, HP, RS/6000, GUI, SDK Powerbuilder C++, Visual Basic
Fulltime/Consulting Positions available in the US/ABROAD
STRATEM
800-582-JOBS
TEL (212)967-2910
FAX (212)967-4205
124 W. 30th St. Suite #302
New York, N.Y. 10001

Sunbelt Opportunities
SUNBELT RECRUITERS
Attn: Rick Young, C.P.C.

[illegible] N G

All across the United States, software professionals are discovering new ways to expand their opportunities with CTG. As the area's oldest and largest integrated information technology services company, we service an impressive list of Fortune 100 companies.

We also provide an outstanding array of benefits, highly competitive rates and the security and career options that only a growing industry leader can offer.

Whether you're interested in a regular salaried or hourly staff position, you'll discover the widest array of professional opportunities available, at CTG.

Tampa, FL

Cobol/CICS/DB2 · IMS DB/DC · Sybase
C/UNIX · PowerBuilder

Atlanta, GA

Visual Basic · Peoplesoft/DB2/SQR
OS/2 Presentation Manager · Dun & Bradstreet E or M Series
Adabase Natural

Fort Lauderdale, FL

OS/2 Developers · Oracle Forms
PowerBuilder · Visual Basic/MS Access
Telephony

Memphis, TN

IMS DB/DC · Cobol/CICS Testing
Sybase DBA · UNIX/C
UNIX Testers/QA

Nashville, TN

Cobol/CICS/DB2 · IMS/DB2 · PowerBuilder
Oracle · IDMS

Orlando, FL

PowerBuilder · Oracle
Microfocus Cobol/DB2 · C++/UNIX
AS/400

Jacksonville, FL

Visual Basic · PowerBuilder
Oracle · SQL

[illegible]
South Region
Staffing Center
5780 Oakbrook Parkway
Suite 105
Norcross, GA 30093
Phone (800) 788-2159
Or Fax to (800) 345-5382
EOE M/F/D/V

ctg

Applications Developers

SALT LAKE CITY, UTAH

American Stores Company is one of the nation's largest retail grocery chains. The migration of our Systems Development Center to Salt Lake City has created many career opportunities for qualified individuals with 2-3 years' experience (retail desired) in the following areas:

Applications Programmers

COBOL/COBOL II, MVS, CICS, DB2/SQL, IMS DB/DC, DB2 & UNIX combination, VSAM, PL/1 a plus

Systems Analysts

Structured Analysis & Design, On-Line M/F, Client/Server, DB2 & UNIX combination.

Application Tools Specialists/ System Architects

IMS DB/DC, DB2/SQL, CICS, QMF, or Teradata, Data Administration, Development Tools.

Store Systems Application Developers

ICL/Datachecker; 4680/Basic, ADCS, NDM, NCCF.

American Stores offers attractive compensation, relocation, and benefits package. To apply, please send/FAX resume & salary requirements with a cover letter detailing your knowledge and experience to: **American Stores Company, Attn: Job# 0919-CW, P.O. Box 990, Pleasanton, CA 94566-9998. Fax: (510) 833-6328.** *EOE*

AMERICAN STORES COMPANY

CONSULTANT needed for a computer consulting firm in SW Ohio. Duties include programming, testing and documenting multiple computer systems for multiple business applications. Will use UNIX, C, C++, ORACLE, Object-View, Easyflow, Object Center, SQL, Visual Basic, Progress, and several relational data bases. Work will be performed on both UNIX, and MS/DOS operating systems. Will also be involved in network administration, UNIX system administration, and Object Oriented Analysis and Design. Will port software between UNIX platforms. Applications will focus on materials management, system administration, and information systems management. Applicant must have B.S. in Electronic Engineering, Mathematics or Computer Field. Equivalent Foreign degree is acceptable. Applicant must have 1 yr exp. in job duties described above or 1 yr. exp. in a computer related field which must include exp. w/ UNIX, C, SQL, UNIX system administration, porting software between UNIX Platforms; Object Oriented Analysis and Design, C++, and one relational data base. 40 hrs/wk, 8am-5pm, $40,320.00 per yr. Must show proof of legal authority to work indefinitely in U.S. Send resume to duplicate (no calls) to; K. Shockley, JOB # 00613, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216.

PROGRAMMER ANALYST - Study & analyze business function requirements to be to design & develop computer application and/or software products. Perform quality control & assurance for software applications. Perform program development on IBM mainframe using COBOL, DB2, IMS-DC, TSO/SPF, CLIST, JCL & CICS. Acts as project manager or team leader on design/analysis projects. Salary, $48,000 per year, 40 hour week (8:30 - 5:30). Requirements, Bachelor degree in Mechanical Engineering or Computer Science or Computer Engineering; 4 years experience in related occupation as a Computer Consultant; experience must include development of computer systems on IBM mainframes using COBOL, DB2, CICS, TSO/SPF & CLIST, development of software quality assurance standards for COBOL, DB2, CICS programs on IBM; management of software development projects. Send resume: MESC, 7310 Woodward Ave., Rm. 415 (Ref #92494) Detroit, MI 48202. Employer paid ad.

To grow your company, just add water.

Come to Clearwater, Florida this fall for the IT event of the year – the NACCB conference. For anyone in the Technology Consulting business, this is an invaluable opportunity to keep abreast of what's happening in our industry. Aside from numerous networking opportunities, our agenda will keep you informed on such topics as:

- Industry Sales Techniques
- New Recruitment Methods
- Company Growth Strategies

NACCB CONFERENCE
OCTOBER 12-16, 1994
Clearwater, Florida

For more information call: **(800)849-1680**

NACCB National Association of Computer Consultant Businesses

Scientific Programmer/Analyst for firm in NE Ohio. Will participate in the following projects: designing a compounding advisor system which uses computer artificial intelligence and database technology to simulate rubber compounding for passenger tires, designing various components of the advisor system, including an expert knowledge database, a set of neural networks, and a set of auxiliary system tools, and designing a user-friendly interface to enable end-users to use the advisor system more conveniently. Must have M.S. in Computer Science. Academic program must have included one graduate-level course each in the following areas: Intelligent Systems, Neural Networks, Distributing Processes and Interconnecting Networks, Image Processing, and Research (in Neural Networks Artificial Intelligence, and Distributing Processes). Must have 2 yrs in job described or 2 yrs exp with computer programming. Must be able to do data acquisition and processing, database management and maintenance, C/UNIX programming, Oracle programming, Sybase programming, and network communication, and to use fuzzy logic mathematical methods, graphic user interface (GUI), and IBM mainframe. Must also be conversant with artificial intelligence, neural networks, and rubber processing and compounding technology. These skills may be evidenced by academic letter(s) of reference and/or employer(s) testimonial(s). Exp may be gained before, during, or after degree. 40 hrs/wk., 8:00am-5:00pm, $50,000/yr. Must have proof of legal authority to work indefinitely in U.S. Send resume & course transcript in duplicate (NO CALLS) to J. Davies, JOB #00579, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

Join us in
Paradise

Our Excellent staff has earned us a reputation as the top Consulting Company in Phoenix! We are looking for top-notch consultants to help us maintain our #1spot

If you have any of the following:

- IMS DB/DC, DB2
- CICS, DB2
- AS/400, COBOL
- ACP/TPF
- VISUAL BASIC, Microsoft or SQL Server

Contact Laurie Baker
4747 N. 7th St. Ste. 424
Phoenix, Arizona 85014
Fax (602) 279-1161 or call
(602) 279-4498 or
1-800-279-4498
We offer both excellent salary and benefits.

Professional Software Consultants, Inc

Programmer/Analyst (Tampa, FL client site) Analyze requirements, design, develop, code, test, implement & maintain commercial and financial applications systems using RPG 400 in an IBM AS/400 environment. Bachelor's Degree in Engin'ring, Comp. Sci., or Math + 2 yrs' exper. in job. Development work must include two years of experience using RPG 400 in an IBM AS/400 environment. $37,000/yr; 40 hr/wk, 8:30 a.m. - 5 p.m. Send resume to: Job Service of Florida, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater, FL 34618-4090. Re: JO# FL 1103233.

Computerworld recruitment advertising works!

That's because more computer professionals read more recruitment advertisements in *Computerworld* than in any other newspaper. For more information or to place your advertisement, call **Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).**

Weekly, Regional, National. And it works!

Chair in Computer Science

Department of Computer Science
School of Mathematical & Information Sciences

Vacancy UAC.490

The University of Auckland seeks to appoint a qualified Computer Scientist who has the research and teaching skills to make a significant contribution to its Department of Computer Science

The University, with over 22,000 students is sited in the heart of New Zealand's largest city Auckland is the international gateway to New Zealand, the major industrial, commercial and cultural city in the country and offers an exceptional range of lifestyles and recreational activities

Our Department of Computer Science occupied new well-equipped laboratories and offices in 1991 and offers a modern pleasant working environment in which the interests of academic staff are supported well The Department has over 500 equivalent full time students and is projected to have substantial future growth in graduate student numbers The new Chair will be expected to play a leading role in developing advanced teaching and research within the Department

Applications are welcomed from those who believe they are qualified for this challenging position The successful applicant will be expected to have an accomplished teaching and research record We are willing to accept applications from candidates from all backgrounds but may favour those in the applied or experimental Computer Science area

Commencing salary will be established within the range NZ$80,000 - NZ$100,000 per annum

Further information, Conditions of Appointment and Method of Application, should be obtained from the Academic Appointments Office, The University of Auckland, Private Bag 92019 Auckland, New Zealand, phone 64-9-373 7999 ext 5097, fax 64-9-373 7023 **Three copies** of applications should be forwarded to reach the Registrar by **28 November 1994**.

Please quote Vacancy Number UAC.490 in all correspondence.

W B NICOLL, REGISTRAR

New Zealand

The University has an equal opportunities policy and welcomes applications from all qualified persons

DATABASE CONSULTING

Quatrix, Inc. is hiring the following:

- ORACLE CASE
- ORACLE FINANCIALS 9.4, AOL
- ORACLE V7.0, SQL*FORMS V4.0
- ORACLE V7.0, DBA's
- POWERBUILDER/BACHMAN
- MS-WINDOWS SDK 3.1
- SQL-SERVER
- GUPTA SQL
- BANYAN VINES
- C++

These positions are immediate and we will hire employees or contractors. For employees, we offer fully paid benefits, including dependent coverage. EOE

QUATRIX, INC.
David Graziano
700 Office Parkway, Suite 207
St. Louis, MO 63141
1-800-993-7754 (Voice) 314-993-6674 (Fax)

Professional Services Career Opportunities

Is your current job turning you into some kind of monster?

We're looking for some really good people this month.

Immediate opportunities available for IS Professionals with:
COBOL, CICS, IMS, DB2, PL1; DB2 DBA, IMS DBA, ORACLE DBA, ORACLE CASE; ADW; Uniface; UNIX, C, C++, OS/2, Visual Basic, Smalltalk, Powerbuilder, Sybase, AS400, Lotus Notes, Pacbase, DEC/VAX, BAL.

People like you!

Every company has a special culture. At Compuware it's very special indeed. While we're one of the fastest growing information technology companies in the world, we believe there's more to life than just a job. Maybe that's why so few people give up their careers at Compuware. If you're an IS professional, with the skills to get ahead and know that there's more to life than the daily grind, there's opportunity at Compuware Corporation and our System Software, Uniface and Professional Services Divisions.

Call: Corporate Recruiting at (800) 292-7432; Fax: (810) 737-7676
31440 Northwestern Hwy. Dept. CW-19, Farmington Hills, MI 48334

Appleton	(800) 900-1278	Colorado Springs	(719) 592-0667	Madison	(800) 289-2762
Baltimore	(410) 234-1333	Denver	(303) 290-0000	Milwaukee	(800) 527-0462
Columbus	(614) 847-8212	Lansing	(517) 393-0000	Minneapolis	(800) 279-3880
				Washington DC	(301) 683-1143

COMPUWARE

[illegible] CONTRACTOR DATABASE

Large International Contract Agency wishes to purchase current and legal databases for the following areas:

Seattle, WA
Atlanta, GA
Austin, TX

Skills needed include Programmers, Analysts, Network Engineers and Software Engineers

Please Contact - Lou Rickley
3180 Crow Canyon Place, Ste. 100
(510) 866-1030
FAX (510) 866-1722

Email - EDP-MicroTemps@cup.portal.com

SUNBELT OPPORTUNITIES

DBA - DB2, IEF e+	$60K
PM's - IEF, Mfg, etc	$55K
Cap. Planner - MVS/ESA	$60K
PM - C++, XBASE	$45K
SP - MVS/ESA	$55K
Pr Mgr - Cr. Cards, CICS	To $70K
PM - Cr. Cards/Banking, CICS	$53K
Pr Mgr - Trust, Cl. Serv	$65K
PM - PROGRESS, HP-UX, CICS	$50K
PM - C, C++, Win, Access	$52K
DBA - DB2 or IMS	$60K
PM - Powerbuilder, C++, Oracle	$60K

Many other opportunities available.

JIM BOSTIC SR.
PHILLIPS RESOURCES GROUP
P.O. BOX 5004
GREENVILLE, SC 29606
803/271-0400 - FAX

TANDEM PROFESSIONALS

CISCORP, a national systems integration firm and a preferred service provider for Tandem Computers, has requirements as follows:

COBOL, SCOBOL, C, TAL, SQL, TELCO, CLIENT-SERVER, UNIX

CISCORP provides excellent benefits to our employees including an Employee Stock Ownership Plan. For confidential consideration, please mail resume to:

Rob Dougherty-MS 0808
Penn Center West II, Suite 430
Pittsburgh, PA 15276
800/969-0099 or fax 412/787-3070

CISCORP

Equal Opportunity Employer

INFORMATION SYSTEMS PROFESSIONALS

Immediate Opportunities

Quantum Information Resources has been one of North America's elite employers of Information Systems Consultants for over 25 years. From our Canadian roots, we have been rapidly expanding in the U.S. for more than eight years by developing quality leading-edge business solutions for Fortune 500 companies.

We currently seek top notch professionals for permanent positions requiring the following expertise:

COBOL, CICS, DB2 (New Jersey & Pennsylvania) - Programmer/Analysts with two or more years of maintenance or development experience required. Exposure to insurance or pharmaceutical applications is an asset.

COBOL, IMS DB/DC (New Jersey & Pennsylvania) - Programmer/Analysts with a minimum of two years experience required to work in a large team environment developing and maintaining insurance applications.

POWERBUILDER or VISUAL BASIC (New Jersey & Pennsylvania) - Full development team required to redesign business applications using state-of-the-art technologies.

TANDEM, TAL (Pennsylvania) - Programmer/Analysts with a minimum of 6 months hands-on Tandem TAL experience. Exposure to banking applications desired.

IEF (Georgia) - Senior Software Specialist required for installation and support of IEF tools. User support and training experience a plus. Familiarity with all phases of IEF required.

PL1 (Georgia) – Team of Programmer/Analysts needed for a large conversion, from PL1 to COBOL, of a highly sophisticated international application.

UNISYS 1100/2200, COBOL (Georgia) - Programmer Analysts with a minimum of two years experience required. High-volume on-line transaction experience is desired.

Our outstanding salaried career positions offer a highly competitive compensation package including full benefits and relocation assistance where needed. To investigate these exciting opportunities, call or fax your resume in confidence, to:

Carol Zampogna, Personnel Coordinator
200 Middlesex Essex Turnpike, Suite 200, Iselin, NJ 08830
(800) 274-7004 Fax: (908) 283-4892.

Only candidates seeking permanent, salaried career positions need apply.
Equal Opportunity Employer.

quantum
INFORMATION RESOURCES INC.
NEW JERSEY · PHILADELPHIA · ATLANTA

Sr. Software Engineer/Telecommunications Systems Test-Research & analyze software rqmts to test stability/functionality of software systems upgrades to the digital electronic switching system; formulate, design & develop new stability traffic load for software upgrades & program new load in traffic generators, develop & direct software system testing procedures for call failures to machine code level, using exp in design/implementation of telephony traffic generators, simulators & controllers, In-Circuit Emulators, Protocol Analyzers, Call Tracers, Digital Switching & Pulse Code Modulation (PCM) systems, Motorola 68000 microprocessors & assembly language, SS7/CCITT#7 standard, ISDN call protocols, Level 2&3 Digital Access/Digital Private Network Signaling Systems (DASS2 & DPNSS), System X, DEC & UNIX. 40 hrs/wk, 8-5, $56,663/yr. Job in Boca Raton, FL. RQMTS: BS in Telecommunications & 4 yrs in job offered or as Systems Programmer in telephone switching systems w/exp identified above; or if w/o degree, 6 yrs exp in job offered or as Systems Programmer in telephone switching systems w/exp identified above. Mail resume to: Job Service of FL, 2660. W. Oakland Park Blvd., Fort Lauderdale, FL 33311-1347, RE JO# FL-1110382.

SYSTEMS ANALYST: Develop and maintain data merge and data analysis application on mainframe computer. Design and develop integrated database systems using higher level languages and data transfer communication system on mainframe, mini computers and PC's for Sales Force Automation Systems and analysts. Develop training materials for clients. Maintain mainframe hardware. Require 1) Bachelor's degree in Computer Science, 2) Six (6) months of experience in the job offered or as a Computer Analyst, and 3) The required 6 months experience must be on mainframe, mini computers and PC's using Sales Force Automation Systems software and higher level languages such as Pascal and C. $38,000/yr., 40 hrs/wk., 8-5. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of Resume, Diploma, and Experience Letters to: Illinois Dept of Employment Security, 401 S. State St., 3 South, Chicago, IL 60605, ATTN: Mary Millea Ref. #V-IL-10899-M. No Calls. An Employer Paid Ad.

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

For over two decades, Computerworld has delivered qualified job candidates to America's employers.

And ever since Computerworld's first weekly issue in 1967, America's companies have relied on Computerworld to target America's most qualified computer job candidates.

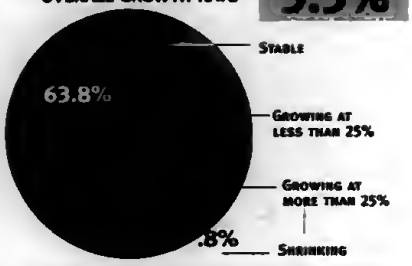
To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, **at 800/343-6474 (in MA, 508/879-0700).**

COMPUTERWORLD
Where the qualified candidates look. Every week.

CAREER SURVEY: Telecommunications

INDUSTRY HIRING TRENDS

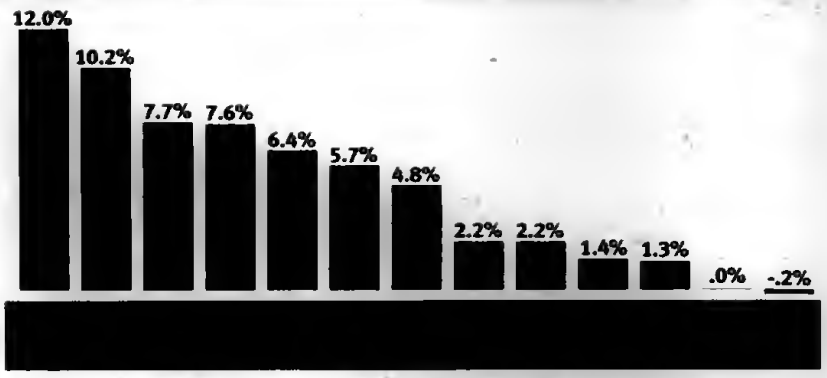
OVERALL GROWTH RATE **5.5%**



SURVEY BASE: 243 TECHNOLOGY FIRMS INVOLVED IN TELECOMMUNICATIONS
SURVEY CONDUCTED BETWEEN JUNE '94 AND AUGUST '94.

© Copyright 1994, Corporate Technology Information Services, Inc., Woburn, Mass.

REGIONAL GROWTH ANALYSIS



CORPTECH, A DIRECTORY PUBLISHER IN WOBURN, MASS., TRACKS THE U.S. 35,000 TECHNOLOGY MANUFACTURERS. THIS SURVEY RELATES TO THE 28,437 TRACKED FIRMS WITH FEWER THAN 1,000 EMPLOYEES.

TEXAS

The economy is enjoying some growth, but information systems professionals must hunt for pockets of opportunity

By Charles T. Clark

Healthier bottom lines are sweeping Texas, but few new technical opportunities have been created as a result.

"The economy is pretty good in this region," says Syd Limerick, manager of enterprise computing provisioning at Texas Instruments, Inc. in Dallas. But like many large firms looking to hold costs down, TI has not made hiring a priority.

In today's economy, companies are downright selective. That means only the most current skills open doors. But if you're bent on change, Austin, San Antonio and Dallas offer more fertile markets in Texas.

Austin's software industry holds particular promise, especially with a 15% increase in growth each year, reports Angelos Angelou, director of economic development at the Austin Chamber of Commerce. In addition, Advanced Micro Devices, Inc.'s new chip manufacturing facility, which will be completed early next year, is expected to add several new information systems positions.

Likewise, San Antonio's business sector is adding new jobs, according to Mario Hernandez, president of the Economic Development Foundation. But despite a strong economy, the city's largest nongovernmental employer, United Services Automobile Association, is doing little hiring, and when it does, it usually hires recent college graduates. "If we get into a skill shortage, we would go outside to hire the specific skills," says Ray Stanley, vice president of information technology planning. "It would probably be client/server or object-oriented skills."

On a much slower track, the economies of Dallas and Houston have struggled, but there are signs of recovery. "The financial industries are strong right now," says Dale Swasick, president and founder of Hall and Swasick, Inc. Telecommunications companies also offer hope.

Sabre Decision Technologies, a division of AMR Corp., is also hiring a "moderate number" of IS professionals, according to Thomas Cook, president of the division.

Bright spots even exist in Houston, although pickings are slim. Compaq Computer Corp., Baylor College of Medicine and some consulting firms are searching for a few good people. "I'm looking for programmer/analysts with payroll experience, senior network technicians, Unix systems administrators and computer operators," says Fran Chambers, director of the enterprise services group at Baylor.

Even so, recruiters caution that only the right tools will land jobs. "If you're not someone with pretty specialized skills — client/server, open systems or object-oriented technology — then it would be very hard to break in here," Stanley says. ■

Clark is a free-lance writer in Haverhill, Mass.

Best places to work

COMPANY	STAFF GROWTH	TURNOVER
Burlington Resources, Inc., Houston	Increasing	5%
Shell Oil Co., Houston	Decreasing	5%
Electronic Data Systems Corp., Houston	Increasing	5%
Compaq Computer Corp., Houston	Increasing	5%
State of Texas, Austin	Increasing	0%
University of Texas, Austin	Unchanged	10%
Southwest Airlines, Dallas	Increasing	5%
AMR Corp., Dallas	Unchanged	5%
Sysco Corp., Houston	Decreasing	2%

Source: Computerworld's Best Places to Work survey

Largest employers (ranked by number of employees) / Unemployment rate

AUSTIN — 4.0%
- University of Texas
- Texas Department of Transportation
- Austin Independent School District
- City of Austin
- Motorola, Inc.

Greater Austin Chamber of Commerce

DALLAS — 5.9%
- AMR Corp.
- Texas Instruments, Inc.
- Dallas Independent School District
- U.S. Postal Service
- City of Dallas

Greater Dallas Chamber of Commerce

HOUSTON — 7.3%
- Brown & Root
- Shell Oil Co.
- Continental Airlines
- Exxon Corp.
- Houston Industries, Inc.

Greater Houston Partnership

SAN ANTONIO — 5.7%
- Kelly Air Force Base
- Fort Sam Houston
- Lackland Air Force Base
- United Services Automobile Association
- H.E.B.

Dallas McCarter & Associates, Inc., San Antonio

SAP CONSULTING

Strategic Services

KPMG Peat Marwick LLP, the largest international professional services firm specializing in Performance Improvement, Technology Architecture and Systems Integration consulting, seeks professionals to join our expanding Client/Server practice with special emphasis on SAP.

We are seeking professionals with strong experience in one or more of the following:

- SAP business functionality
- ABAP/4 development
- Oracle or Informix

Our practice focus is in the configuration and implementation of the R/3 system. Successful R/2 candidates will be trained in R/3.

Opportunities exist throughout the Midwest, Southwest and Ohio Valley. In return for your expertise, we offer a very attractive compensation package which includes comprehensive benefits. For immediate consideration, please call (312) 938-2843 or send/fax resume, indicating geographic preference(s), to: Staffing Manager, KPMG Peat Marwick, 303 E. Wacker Drive, 22nd Floor, Chicago, IL 60601. Fax (312) 938-5379. Equal Opportunity Employer.

KPMG Peat Marwick LLP
THE GLOBAL LEADER℠

StaffWare Consulting, a leading data processing consulting firm in Houston, Texas for more than 10 years, is seeking computer professionals with the following skills for contract and permanent positions.

- C, C++, DATA STRUCTURES
- C, C++, OOP
- EASEL
- FORTRAN, HP3000 OR VAX
- INTERBOLV APS
- LANDMARK OPENWORKS
- LOTUS NOTES, 50% TRAVEL
- MS-WINDOWS APPL. DEV.
- NATURAL/ADABAS
- NEXT, NEXTSTEP
- ORACLE FINANCIALS
- ORACLE, UNIX, C
- PARADOX ENGINE, C
- POWERBUILDER
- SAP
- ZINC, C

STAFFWARE

StaffWare, Inc.
111 North Loop West
Suite 800
Houston, TX 77008

Phone: 713-880-0232 FAX: 713-880-8038

Member NACCB

Commited To Excellence

A respected national computer consulting firm & Business Week "fastest growing" high-tech company,

CSD NEEDS YOU IN TEXAS!

Programmer Analysts

STRONG COBOL II

IMS DB/DC a Definite Plus!

Perm & Long Term Temp Assignments
Relocation Assistance Available

Contact Corporate Recruiting:
Computer Systems Development, Inc.
242 Old New Brunswick Rd, Piscataway, NJ 08854
Phone: (800) 562-8805 Fax# (908) 562-8911

SOFTWARE ENGINEERS

If you're tired of long hours, poor working conditions, unrealistic deadlines, etc., etc.,, then you need to make a change today! Contact Cutler/Williams, Inc. without delay to hear about challenging projects, outstanding pay and benefits (including 401K, paid vacation and holidays, plus paid overtime). Cutler/Williams is a company with 25 yrs. experience in data processing consulting. This fast growing corporation prides itself on continuous improvement, customer satisfaction and employee recognition programs. C/W has staff positions available for Data Processing professionals with significant experience in one or more of the following areas:

- COBOL, IDEAL, DATACOM, CICS e +
- COBOL, DB2
- SYBASE DBA
- COBOL or ALC, CICS, VSAM or DB2
- ORACLE, VISUAL C++, UNIX or AIX
- MICROFOCUS COBOL, OS/2
- INFORMIX, C, UNIX
- VISUAL C++, MS/WINDOWS
- IAD Facilitator
- C, C++, PASCAL, MS/DOS, WINDOWS
- IEF

Those selected will become part of large-scale applications development efforts in capacities ranging from team members to individual contributors. Call or send resume to or check Opportunity Network online:

CUTLER/WILLIAMS 25 years

Jack Sparks
Corporate Recruiting
Cutler/Williams, Inc.
4000 McEwen South
Suite 200
Dallas, Texas 75244

800/527-4987
214/980-7053 FAX: 214/991-0821

Equal Opportunity Employer

GREAT IDEAS AT WORK

If you want to create technology that will determine the speed and direction of this industry, you can do it here. Be a part of the push to invent and innovate. Work to discover your own potential, in an environment that merges diverse skills, backgrounds and experience together into a common course. To be the Number One computer company by 1996.

Because there's a place for the dreamers that do, and the doers that dream. That place is right here, at Compaq.

All positions are located in Houston, TX unless otherwise indicated. Relocation assistance is available.

SAP Specialist, Technical Sales Support

You should have a BS/BA in a Marketing, Computer or Systems related discipline and 5+ years of related industry experience including a background in mainframes, minicomputers, and personal computers. Additionally, 2+ years of SAP related experience including business process re-engineering, SAP implementation, requirements definition, project management and ABAP development is essential. SAP installation and hardware platform evaluation is a plus. Dept. RVMS-CW-0919-SAP

Systems Engineer

In addition to a BS in Electrical Engineering, Computer Science or equivalent, you should possess technical expertise in the following topics: relational databases (especially ORACLE or SQL SERVER) and client/server application development strategies (especially Powerbuilder, Visual Basic, or Oracle Tools). Expertise in Network Operating Systems (especially Novell NetWare, Microsoft NT and SCO UNIX®) and excellent client management and presentation skills are key. Candidates with demonstrated capabilities in system integration, problem resolution or programming at either the system or application level will be given preference. Dept. RVMS-CW-0919-SE

Technical Support Engineers

To qualify, your background should include an AS/BS in Electronics, Electrical Engineering, Engineering Technology, Computer Science or equivalent and 2+ years' experience in hands-on PC repair and Telephone Technical Support. Familiarity with Novell Netware and Banyan Vines is key as is hands-on experience diagnosing and troubleshooting RDBMS software issues, preferably in Oracle. Excellent communication skills are necessary, vendor certification (CNE, CBE, ACE, etc.) in one of these operating environments is a plus. Dept. GDS-CW-0919-TSE

Field Systems Engineer

– National Account Database Server Support –

Positions are available in our Regional Area Sales Offices located in CA, IL, TX, GA, and MA. In addition to a BS or equivalent in Business, MIS, Computer Science or related field, you need 2-3 years' RDBMS, preferably Oracle, and 6+ years' computer industry experience. Excellent presentation and communication skills are essential, as you must clearly communicate business and technical knowledge to technical and non-technical audiences both internally and externally. Familiarity with UNIX network issues, experience in micro, mini and mainframe distribution support models, a background that includes working with a GUI environment, and experience with pre- or post-sales system resolution are all preferred. 50-70% travel is involved. Dept. RVMS-CW-0919-FSE

We also have positions available for Trainers, Marketing and Sales professionals.

Compaq offers competitive salaries, comprehensive benefits, and an environment that supports creativity, open communication, and team involvement. To find out more about joining the Compaq team, submit your resume and salary history, indicating department of interest, to: Compaq Computer Corporation, MC 060211, P.O. Box 692000, Houston, TX 77269-2000. Or fax to (713) 374-0080. An equal opportunity employer m/f/d/v. All trademarks are registered to their respective companies.

COMPAQ

INFORMATION TECHNOLOGY MANAGEMENT CONSULTANTS

Houston & Dallas Opportunities

Immediate responsibility is just one excellent reason to switch your career to management consulting with Ernst & Young. As one of the leading international professional services firms, we can offer you varied, high-profile engagements and exposure to the latest technologies.

Advantage:

For Our Clients, For Your Career

Join us in our Management Consulting Practice in Information Technology Services. These positions offer you challenging engagements in industries as diverse as oil and gas, retail, manufacturing/high tech, financial services and insurance.

Due to our continued success and growth, we have immediate opportunities for senior and staff level consultants with at least 1-8 years of applications development experience. Prior experience in consulting with structured design methodologies is strongly preferred. Software package implementation experience (i.e. manufacturing, SAP, financial and/or human resources) a definite plus.
A bachelor's degree, or the equivalent, is required.

Our consulting positions offer the opportunity for growth, the freedom to create innovative solutions and to work with the best people in the business. For immediate consideration, please send your resume to:

For Houston:
ERNST & YOUNG LLP
Dept. SMC-TH
1221 McKinney, Suite 2400
Houston, TX 77010

For Dallas:
ERNST & YOUNG LLP
Dept. SMC-DG
2001 Ross Ave., Suite 2800
Dallas, TX 75201

An equal opportunity employer.

ERNST & YOUNG LLP

GOOD SHEPHERD MEDICAL CENTER

MEMBER, TECHNICAL STAFF IV. ORACLE DBA. Position requires 10+ years total experience, including 4+ in ORACLE database mgt. systems with version 6.0 or higher; 2+ yrs. hands-on ORACLE programming and 2+ yrs. ORACLE DBA, with 2+ yrs "C" programming. Comprehensive use of structured design tools, ORACLE case tools, SQL Plus, ReportWriter. Project lead experience; UNIX & ORACLE Financials, a plus. Bachelor's degree required; Master's in related field preferred. Excellent career opportunity in progressive organization located in family-oriented community of 75,000. Submit resume and salary requirements to: Human Resources Office, 700 East Marshall Avenue, Longview, TX 75601. Employee paid ad. EOE.

Computemp is a National temporary staffing service specializing in Technical support in the Data Processing industry. We have positions available in the following professions.

Call the office nearest you.

Computemp of
Dallas
(214) 661-1064
Fax: 661-9143
Houston
(713) 623-8355
Fax: 623-8357
San Antonio
(210) 930-1640
Fax: 930-1643

A full time position is currently available for a Senior Systems Programmer within the department of Information Systems.

Job requirements include, but are not limited to the following: 5 or more years of IBM mainframe systems level programming. Experience in directing and performing installation, debugging, tuning, maintenance and configuration of systems level software. A bachelors degree in Computer Science or MIS is preferred.

For immediate consideration, qualified candidates should call or send a resume to:

HENDRICK MEDICAL CENTER
Human Resources Department
Attn: Brenan Fulkerson, 1242 North 19th Street
Abilene, TX 79601-2316. (915) 670-2290
(800) 933-2289. Fax (915) 670-4417

Smoke Free/Drug Free Environment-Equal Opportunity Employer

PAR

Due to the upswing in the Texas economy, our Dallas & Houston offices currently have projects requiring the following skills:

- VISUAL BASIC
- SAP
- PROGRESS
- DBO/COBOL
- SW 2000
- INTERGRAPH
- ORACLE
- JD EDWARDS
- UNISYS/COBOL
- AS/400
- UNIX
- PATHWORKS

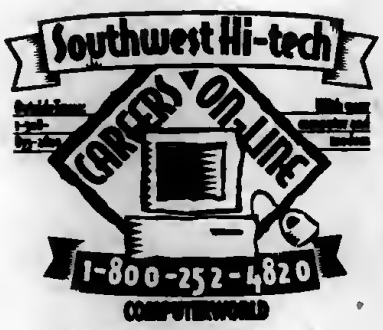
PAR, INC.
12655 N. Central Expwy., Ste. 322
Dallas, TX 75243
214/980-9660 • Fax 214/980-1976

Recruit The Best!

Place your advertisement in regional or national editions of Computerworld's Computer Careers section. For more information, call Lisa McGrath.

800-343-6474
(in MA, 508-879-0700)

Available Now for resume posting & job seeking!



This service is available at no charge to job seekers.
Callers outside of Texas incur the cost of their telephone call.

Texas Regional Scope

PDC

PERFORMANCE DEVELOPMENT CORPORATION

PDC, a leader in management technology consulting and training for over twenty years, provides services to major corporations and government agencies worldwide. Recent growth has created opportunities for experienced consultants who are able to travel, provide excellent references and have skills in the following areas:

[redacted]

Management-oriented planning and technology-oriented design and implementation opportunities are available. Some openings require specific expertise such as IEF (GUI, C/S), BDF, SAP, Bachman, Powerbuilder, Seer, Oracle, Sybase and Unix.

PDC is particularly known for blending multiple approaches and technologies together to provide practical, implementable, advanced business solutions to its customers in reasonable time frames. We focus on added value consulting, education, and knowledge transfer to our customer's staff.

If you are interested in joining an organization that is committed to its customers and rewards its consultants based upon their contributions, please fax your resume to:

PERFORMANCE DEVELOPMENT CORPORATION

8131 LBJ Freeway, Suite 600 Dallas, Texas 75251
Phone (214) 644-4730, (800) 828-8615 Fax (214) 644-2330

Princeton ■ Dallas ■ Detroit ■ Los Angeles ■ London

Southwest/Midwest High Tech CAREER FAIRS!

Telecommunications

FREE! No Pre-Registration. Bring Resume. Principals Only.

Dallas
Sept. 19-20

Adia Information Technologies
Aerotek
Alcon Laboratories, Inc.
Andersen Consulting
ARGO Data Resource Corp.
Cap Gemini America
Chrysler Technologies Airborne Systems, Inc.
Citicorp
Compaq Computer Corp.
CompUSA, Inc.
Computer Dimensions, Inc.
Conroy Technical Services
Coopers & Lybrand
Computer People
Corporate Software
Cutler/Williams
Dallas Systems Corp.
Datranics, Inc.
Decision Consultants, Inc.
DSC Communications Corp.
E-Systems, Inc./Garland Division
EDS
Electronic Systems, Inc.
Ericsson Radio Systems, Inc./ Ericsson North America, Inc.
Ernst & Young
First Data Card Services Group
Force 3, Inc.
Hestair Computer Group
InfoTec
Intecom, Inc.
Interactive Business Systems, Inc.
J. Driscoll & Associates
JCS Consulting Services, Inc.
Kemtec, Inc.
Kelly Technical Services
Lennox Mortgage USA
Lesco, Inc.
LORAL Vought Systems
Martin Marietta Astronautics
Mary Kay Cosmetics, Inc.
Maybelline Sales, Inc.
MBNA Information Services, Inc.
MCI Telecommunications
Metro Information Services
Motorola
NationsBank
Net-Com Interim Staffing
Nokia
Northern Telecom/BNR
Price Waterhouse
Scott & White
Sear Technologies
Software Solutions
Software Spectrum
Sprint
Structured Software Solutions, Inc.
Tandy Information Services
Telecom Technologies, Inc.
Texas Workers' Compensation Insurance Fund
The Systems Group, Inc.
TIC Insurance
Triad Data, Inc.
TTC
Unisys Corp.-USD

Houston
Sept. 26

Aerotek
Cap Gemini America
Compaq Computer
Coopers & Lybrand
CTG
Cutler/Williams
DSC Communications Corp.
EDS
Ernst & Young
Hestair Computer Group
LORAL Vought Systems
Motorola
Net-Com Interim Staffing
Price Waterhouse
SAI
Staffware
The Registry
Unisys Corp.-USD
Valic
Texas Workers' Compensation Insurance Fund

Kansas City
Sept. 26

Aerotek
Analysts International
Andersen Consulting
Blue Cross Blue Shield of KC
Cap Gemini America
Cutler/Williams
DRT Systems
DST Systems
Ernst & Young
First Data Card Services Group
Informix
Lindenberg & Associates
NAIC
Security Benefits Group
Sprint
Wallman-Hart

Watch For Upcoming Fall Dates:
Atlanta - Oct. 27
Austin - Oct. 24
Tampa/St. Petersburg - Nov. 7

If you are unable to attend, please send your resume to: Career Fair Coordinator, P.O. Box 1458, Dept. CW, Coppell, TX 75019.

Supported by COMPUTERWORLD and the SOUTHWEST HIGH TECH COOPERATIVE. EEO Affirmative Action Recruitment Events. Minorities Encouraged to Attend.

THE LEADING TECHNOLOGY FAIRS FOR THE SOUTH!

Midwest

SENIOR SWITCH ANALYST: Responsible for switch security (providing USERIDS, PASSWORDs and PRIVCLASSES). Responsible or scheduling application and monitoring of software "Patches". Monitor switching system preformance. If problems are identified, issue Trouble Tickets and SMWP's for corrective action to be taken by the Switch Control Center and/or switching site personnel. Schedule and monitor Vendor software and hardware systems upgrades. Review Assessment results from new system installations and make recommendations for or against to Engineering Acceptance. Make site visits to perform quality assurance and acceptance procedures. Standardize hardware and software configurations network wide as the need arises. Evaluate newly developed hardware and software features in a TEST LAB environment. Must have 4 years of experience which must include at least 3 years of experience with the Northern Telecom, Inc., DMS-250 switching system and ability to analyze Assessment results from newly installed NTI DMS switching systems. Contact: Oklahoma State Employment Service Office, 110 S. Hartford, Suite 108, Tulsa, Oklahoma 74120. Job #7207.

WANTED
SOFTWARE ENGINEERS

In the Raleigh, NC area for fast growing dynamic companies with excellent benefits.

- C++/OO
- SMALL TALK
- UNIX
- COBOL
- ORACLE
- CNE
- SAP

Fax resume to:
Brian Hoffman
MANAGEMENT RECRUITERS
19501 Highway 73 West #20
Davidson, NC 28036
Fax (704) 896-1923
Tel (704) 896-1916

MAURICES INCORPORATED
Programmer/Analyst

Maurices Incorporated, a progressive, growth-oriented, nationwide retailer, offers an exciting opportunity for a Programmer/Analyst to join our MIS Department at our corporate offices in Duluth, MN.

This position will be responsible for the development of mainframe and PC systems to support retail business applications.

Qualified candidates must possess a minimum of three years mainframe programmer/analyst experience.

- **Operating Systems:** MVS/XA/ESA, MS-DOS, OS/2
- **Software:** COBOL II, CICS, JCL, SAS, Windows 3.1, Gupta SQLWin

Additional requirements include excellent verbal/written communication skills and the ability to work closely with users to analyze their requirements. Experience working with advanced tools in client/server and relational database technologies desirable.

In return for your skills and contributions, Maurices offers a competitive salary, top benefits and the opportunity to work for a growing company situated in the heart of scenic Northland living. For confidential consideration, please send a detailed resume with salary history to: Maurices Incorporated, Attn: Tim Sversky, 105 West Superior Street, Duluth, MN 55802

Maurices is an Equal Opportunity Employer

Software Developer

ATA Information Systems, one of the nation's leading providers of Electronic Funds Transfer services and related software products, is seeking an experienced Software Developer to join our Product Development Team. The individual should have experience in the following areas:

- Fortran development
- Oracle tools and data base design
- Rapid application development techniques

If you are a creative person who learns quickly, can deliver projects on time and enjoys working in a team environment, send or fax your resume to:

Information Systems
Director, Product Development
5 Revere Drive, Suite 510
Northbrook, IL 60062
Fax (708) 559-1414

★ GO COWBOYS ★
★ CONTRACT OR PERM ★

Technita a leading international consulting firm has openings all over U.S.A. and other, either contract or permanent long term project. Fax resume 214-235-3443 Technita Information, 12101 Preston Rd., #396, Dallas, TX 75240.

NO ENTRY LEVEL

• ADABAS	• EASEL	• AS400/IMAGES
• FOCUS	• COBOL/CICS/DB2	• INFORMIX
• OO ANALYST/DESIGN	• IEF	• C/SET, w/2/AIX
• LAN/SERVER	• C++	• DB2
• DB2	• DB2 DB/DC	• IF3090
• NOVELL	• POWERBUILDER	• TANDEM
• STRAME	• POWERHOUSE	• SAS
• VISUAL BASIC	• SAP	• ORACLE
• WINDOWS	• PRESENTATION MANAGER	

Grow With A Leader.

IRI is a worldwide leader in scanner based market research. With our progressive software technologies and our talented technical staff, we are able to provide our clients with customized marketing solutions to improve their decision making. Our Corporate Office currently needs innovative professionals to manage/direct all aspects of technical and software support in our growing multi-platform environment.

Manager-Network Services

As a successful manager, you must have 5-8 years experience managing a large multi-platform Enterprise Telecommunications network. Proven project management experience with multiple protocols: x.25, IP, IPX, SNA, etc., a must. Router experience is essential.

Software Engineer/Project Manager

As part of our Software Engineering Development team, you will be responsible for the design, development and implementation of APIs in an MVS/UNIX distributed computing environment. You will also be involved in the testing and evaluation of new hardware and software and will actively participate in setting the technical direction for the company.

We require excellent project management skills, as well as an understanding of C programming, UNIX internals, TCP/IP networking, multi-platform interconnectivity and systems planning and design. Experience with AIX and Oracle a plus.

For consideration, please send or fax resume with salary history to our Corporate Office: IRI, 150 N. Clinton, Dept. AR12, Chicago, IL 60661. Fax (312) 474-2005.

information resources

IRI is an equal opportunity employer m/f/d/v

Client/Server Electronic Publishing

Gale Research, Inc., the leader in directory and database publishing for 40 years, has immediate opportunities for several UNIX client/server programming and electronic publishing specialists. We are migrating to a PC client, object-oriented, multi-media programming environment, supported by multiple UNIX servers. Next year, our editorial system will contain over 100 gigabytes of text and multi-media data, and support over 500 local and remote users. Our technology decisions support corporate business objectives, and are built on industry standard architectures.

All candidates must be looking for significant technical and business challenges, be able to manage critical projects simultaneously, and have superior communication skills. Management candidates must have prior experience leading teams or directing staff.

Please forward your resume and a cover letter containing a detailed description of related experiences, and salary requirements, to the address or fax number below.

Director of Electronic Development The successful candidate will possess 5-10 years of database publishing experience. The candidate must have lead the effort to bring an electronic or multi-media product to market in the past year. Strong finance and business skills are required. Will also manage outsource suppliers and services. MBA and EE or CS a plus. **Reply to position "DED".**

Director of NES Systems The successful candidate will possess 5-10 years' experience in large scale UNIX/PC system integration project management, have strong finance and business skills and broad knowledge of object-oriented programming languages, SGML data models, and SQL databases. Strong communication skills are also required. Publishing knowledge and/or an MBA is a major plus. **Reply to position "DNS".**

NES Programmers This is a combined programmer/analyst position requiring 3-6 years of advanced C++ programming with SQL database experience (Oracle, Sybase, etc.), and some Windows GUI expertise. Will work directly with users to ensure linkage between product development and database integrity. SGML and GUI experience a major plus. **Reply to position "NESP".**

Electronic Product Developers Successful candidates must have 3-6 years' experience with ISO 9660 CDROM data formats, DOS and Windows GUIs, and have used one or more commercially available CDROM authoring packages (i.e. Dataware, Fulcrum or Authorware). Will be responsible for working with editorial staff to create, program, and complete electronic and CDROM products under minimal supervision. Publishing industry, SGML or network communications experience is a major plus. **Reply to position "EPD".**

In addition to extremely challenging technical assignments, Gale Research offers competitive compensation, including 401K and tuition reimbursement, and is an equal opportunity employer. Please include the job code in your cover letter.

Gale Research Inc., 835 Penobscot Building, Detroit, MI 48226. Fax: 313-961-6817.

Gale Research Inc.

HONDA

Honda of America Mfg., Inc.

Programmer Analysts

Honda of America Mfg., Inc has several openings for Programmer Analysts at our Marysville, Ohio facility (approx. 30 miles NW of Columbus). The selected candidates will work in a large IBM environment to support the automobile, motorcycle, and engine manufacturing operations; and interact with all levels of users in the definition, development, and implementation of projects.

The ideal candidates should possess a minimum of 2-3 years of experience with the following:

MVS/ESA	CICS
DB2	COBOL II
VSAM	TSO
SAS/QMF	

Honda offers an excellent compensation and benefits package including relocation allowances. Additional career enhancements are also available. For confidential consideration, submit your resume to: **Attn: JKPD994; Honda of America Mfg., Inc.; 24000 Honda Parkway; Marysville, OH 43040-9251.**

An equal opportunity employer. Honda welcomes men and women of all races, colors, national origins, ages, or religions, regardless of disability.

ADVANCED SYSTEMS ENGINEER - Executes software development life cycle for computer systems which includes defining requirements, designing, coding, testing & validating software programs that solve engineering/manufacturing related problems using advanced computer aided technologies. Performs work which involves solving complex engineering system problems by applying an understanding of engineering/manufacturing processes standards & task controls to devise solutions through analysis, design & implementation of computer software as well as integration of software with CAD/CAM & other third-party engineering software. Performs porting including configuring & translating of engineering software to computer workstations used in the design, engineering, tooling & manufacturing operations. Manage projects by analyzing user's systems requirements, consults with clients & systems engineers; studies & performs system analysis on existing systems on different platforms; develops specs; monitors physical aspects including data propagation, optimization & maintenance support (debugging, modifications, fine tuning & code organization); develop acceptance criteria; trains and users & monitors results. Applies CIM and/or CNC, DNC & CMM in order to develop computer interfaces to facilitate & enhance productivity. Salary, $52,900 per year. 40 hour week (8:00 - 5:00). Requirements, Master degree in Industrial Technology or Computer Engineering; must have completed 1 graduate level course in each of the following - Product Design; Interactive Computer Graphics; 3D Computer Aided Design; Principle of Manufacturing; Computer Interfacing & Numerical Control. Send resume to: MESC, 7310 Woodward Ave., Rm. 415 (Ref. #95894) Detroit, MI 48202. Employer paid ad.

Finding a High Tech Job can be as easy as using your PC & Modem.

Dial in, and search through our data base of jobs throughout the USA. The same jobs are listed on all systems.

(404) 662-5500 - S.E. USA
(703) 379-0553 - Mid Atlantic
(813) 791-0101 - Florida

We are a FREE service. You can also register your skills on-line, and our client companies will contact you.

The J-CONNECTION

This Space for HIRE! CALL:

800-343-6474

in MA., 508-879-0700, ask for John Corrigan, Vice President Classified Advertising.

COMPUTERWORLD

Weekly.
Regional.
National.

And it Works!

Software Engineer (will spend majority of time at client sites in Omaha, NE vicinity; balance at client sites in Des Moines, IA, Lincoln, NE & Marshalltown, IA) -Design and develop computer software; evaluate interface between hardware and software; redesign GUI objects; direct testing, programming, documentation, installation. Use MS-Windows SDK, C++, C, SQL, object-oriented methodology; oversee 1-3 programmers. Bachelors/Engineering, Computer Science or Math. 1 year/experience in job offered or 1 year as Programmer/Analyst. Related occupation must include 1 year experience using MS-Windows SDK, C++, C, SQL, object-oriented methodology. 40 hours per week (9-6), OT as needed; $40,000/year. Must have proof of legal authority to work in the United States. Send your resume to Bernard Childerston, Nebraska Job Service, 550 South 16th Street, P.O. Box 4600, Lincoln, NE 68509. Refer to Job Order NE 0119107. This advertisement is paid for by the employer

Software Sales and Marketing Manager for Software Development firm. Duties include: new customer development; conduct system studies at customer locations in CAD-CAM-CAE and MIS (Management Information System). Provide customer with proposed business plan for personnel and cost including areas of computer aided design analysis, optimization and manufacturing, plant and process flow design optimization, piping stress analysis, drafting and detailing, PCB (Printed Circuit Board), VLSI (Very Large Scale Integrated Circuit), and hardware design and manufacturing, architectural design and structural design analysis, geographic information system, multi-media and management information system. Requires a Bachelor's degree in Marketing, Business, Computer Science or Systems Engineer. Requires two years experience in the job offered or two years experience in Software Sales and Marketing including experience with on-site consulting of system analysis and design utilizing CAD-CAM-CAE solutions. Salary is $80,000.00 per year. Hours are 8:00 am to 5:00 pm, forty per week. Send resume to 7310 Woodward, Room 415, Detroit, MI 48202. Ref #102694. Employer paid ad.

COMPUTER PROGRESS UNITED

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for:

ORACLE
LOTUS NOTES
DB2 • IMS • CICS

Send resume or call:
Computer Progress United
12730 Townepark Way
Louisville, KY 40243
(502) 245-6533

Programmer/Analyst: Performance of client customized batch and on-line administrative applications programming and system design in COBOL, TELON, JCL and DB2, employing EASYTRIEVE PLUS, applying STRUCTURED programming techniques. Required: two yrs. exp. in job offered & willingness to relocate at six months to one year intervals to varying client job sites in south and midwestern U.S.A. $33,000/Yr., Mon-Fri. 9-5 (40 hrs./wk.). Apply at the Texas Employment Commission, Dallas, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701, JO#TX7214647. Ad paid by an Equal Opportunity Employer

DATA PROCESSING & ENGINEERING CAREER FAIR 10/3-4

Michigan Technical Recruiters' Network invites you to meet decision makers of Detroit area companies:

Adia Information Tech	Decision Consultants Inc
Analysts International Corp	EDS
Analytical Technologies Inc	Entech
American SCI/Engineering	Ernst & Young
Bartech	Genix Group
Brandon Systems	Kelly Professional Services
CAP Gemini America	Logical Computer Systems
Comprehensive Data Proc	RST
Computer Horizons Corp	Sirco Associates Inc
Computer Task Group	Software Services
Compuware	Source Consulting
Coopers & Lybrand	

October 3 - 2 pm - 8 pm Guest Quarters Suite Hotel, Troy
October 4 - 11 am - 7 pm Laurel Park Manor, Livonia

College degree/minimum 2 years' experience preferred. DP -all software languages/hardware platforms/operating systems; Engineering - all disciplines. For more information call 313.882.2277 or if you are unable to attend, fax your resume to Molly McCarthy, hl communications, inc., 313.882.3620.

supported by COMPUTERWORLD

SOFTWARE ENG. Research & dev s/w for process ctrl systems for Powertrain Engine Operations including transfer line & material handling. Use FloPro ctrl sys to create, modify & organize 3 major application components of auto projects: ctrl logic prog, MMI logic & the RMU sys. Dev & modify FloPro user prog to satisfy custom reqs. Conduct s/w algorithm dev, sys modeling, prog coding & debugging. Apply modern & classical ctrl theories & optimization techniques to dev new s/w prods & improve existing s/w prods. Req MS in computer Eng; 1yr exp designing ctrl sys; grad courses in each: real-time eng, very large scale integ. net circuit sys, solidstate elect & parallel processing h/w. 40hr/wk. 8:20-5:30pm. $38,670/yr. Employer paid ad. Send resumes to 7310 Woodward Ave, Rm. 415, Detroit, MI 48202 Ref# 98484.

CONSULTANTS

- All Skills/Technologies
- 16 Offices from VA to TX
- Salaried or Hourly Compensation Plan

Mail/Fax resume to:
Metro Information Services
P.O. Box 8888, Dept. 1KG
Virginia Beach, VA 23450
Fax (804) 486-8816

METRO Information Services

Research Associate (Computer Programmer II Engineering & Scientific), 40hrs/wk, 8-5, $31,968/12mos yr. Provide project management of molecular sequence databases & neural network tools for human genome research. Responsible for UNIX system administration & TCP/IP, E-mail server, ftp file server, network administration & user support. Integrate existing neural network tools written in C & FORTRAN. Develop new software tools & design user interface using C & X Window Motif for neural network system. Min reqs: Masters in Computer Science. 2 yrs in carrying out those duties set forth in the job offered or 2 yrs in C programming, UNIX system administration, TCP/IP, network administration & SQL database management. 3 college credit hrs in a course covering FORTRAN programming & 3 college credit hrs in computer system performance. Apply at the Texas Employment Commission, Tyler, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O #TX7212010. Ad Paid by an Equal Employment Opportunity Employer

OOA/OOD Developers	$75K
Sr P/A Sybase C++	$55K
QA Unix/C/RDBMS	$55K
DBA's SYBASE	$60K
Oracle/Powerbuilder	$55K
DBA DB2 w/IEF	$60K
P/A's AS400 RPG/Cobol	$45K
P/A's Unix C C++ Informix	$50K
RACF Security Analyst	$40K
P/A's Visual C++	$52K

Oracle Systems Analyst - in Springdale, OH - Analyze reqs, design, develop and implement info. and financial mgmnt systems using ORACLE V.6 on UNIX and VAX/VMS hardware. Use CASE tools, SQL*Forms V3, SQL*Plus, SQL*MENU and Pro*C. Prepare program specs, systems docs; enhance and debug existing systems and programs. 40 hrs./wk., M-F; 9AM-5PM; $42,000/yr. Req. Bach in Comp. Sci., Math, Industrial or Mech. Engineering & 2 yrs. exp. in job described. Send resume in duplicate (no calls) to J. Davies, JOB #00388, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216

Career Opportunities

Lawson Software, a leader in client/server business solutions and services, currently has regional career opportunities available nationwide. Recognized as one of the top 100 software companies in the United States, Lawson designs, develops, markets and services business application software for large organizations of all industry types. Numerous career opportunities are available for individuals who thrive on meeting the needs of an international client base while working in a highly motivated, team-oriented environment.

Account Manager

Responsibilities will include providing our clients with software implementation, project management and issue resolution

Ideal candidate will have project management & implementation experience, as well as a strong understanding of implementation methodology and customer satisfaction. Experience using project management tools and exceptional verbal and written communication skills a must. This position requires the ability and flexibility to travel and eight to ten years of related experience.

Consultants

Finance/Human Resources/Materials Management

We are seeking Software Consultants for each of the following: Materials Management, Human Resources and Finance. Responsibilities will include providing end-user classroom training and consulting services utilizing Lawson's products. Requirements include a bachelor's degree in a related field along with public speaking skills. Two to four years computerized business application systems experience on UNIX, AS400 and/or implementation skills an added plus. Excellent communication, interpersonal and problem-solving skills necessary. Overnight travel required.

UNIX Technical Service Consultant

Responsibilities include product installations, technical training and operational usage consulting to our diverse client base. Requirements include at least two to three years UNIX operating system administration experience along with installations and/or implementation background. Excellent communication, interpersonal, verbal and presentation skills essential. Experience with consulting/training a plus. Knowledge of Sybase or Oracle databases preferred. Overnight/out-of-town travel required.

We offer a competitive salary, comprehensive benefits and an opportunity to work in a quality-focused team environment. Please submit resumes (specifying position for which you are applying), which must include salary requirements, to **Karen Ojeda, Sr. Human Resources Generalist, 1300 Godward Street, Minneapolis, MN 55413.** EOE.

LAWSON Software

Atlanta Boston Chicago
Dallas Los Angeles Minneapolis New York

BE A PART OF FIRST DATA'S TEAM...

FIRST DATA CORPORATION (FDC) is a NYSE listed provider of high quality, high-volume information processing services to the bankcard, payment instruments, teleservices, mutual fund, health care, cable television, receivable and information management industries. Our 1993 revenues grew by 24% exceeding $1.5 billion and a net income increase of 22% to over $173 million.

First Data Card Services Group is headquartered in **Omaha, Nebraska** featuring a life style "2nd to none" and a cost of living index that is 7% lower than the US average. Omaha has 9 institutions of higher learning, cultural facilities for Dance, Music and Theater, 7000 acres of parks, 26 public golf courses, over 200 public tennis courts and 8 state parks within a 50 mile radius of the city. We are America's leading credit card transaction processor delivering high-quality services to more than 700 financial institutions... 1 million merchants...and nearly 70 million cardholders around the world.

Immediate opportunities exist in Omaha, our new St. Louis Data Center as well as Data Centers in other major US cities. All our facilities feature a casual dress work environment. We seek Systems and Programming professionals with Bankcard or Financial systems background and technical expertise for the following positions:

- **PROGRAMMERS/ANALYSTS** over 2 years experience in a large scale mainframe environment with COBOL/COBOL II and/or ASSEMBLER, JCL and VSAM. Other positions available require knowledge of CICS and/or DB2/ORACLE, UNIX, TCP/IP, C or C++, Microsoft WINDOWS NT.
- **TEST TEAM MEMBERS** with JCL work experience, and solid understanding of COBOL, and IBM utilities (IEBGENR, IEBCOPY etc.). CA-7, CA-11, and Operational background desired. Requires proactive approach and intelligent risk taking.
- **CICS SYSTEM PROGRAMMERS** with CICS on-line systems installation and maintenance experience.
- **PROGRAMMER ANALYSTS** with knowledge of COBOL, BAL, VSAM, OS/JCL, CICS and ROSCOE. CA-7 and DB2 knowledge a plus. You must be able to work multiple projects simultaneously and prioritize workload as needed. A minimum 2 years Software Development experience and an Associate's degree in Computer Science or equivalent required.
- **DATABASE ANALYSTS** with a minimum 5 years experience in large mainframe environments (SYBASE, ORACLE, or DB2) at DATABASE ANALYSTS. Background in Bankcard or Financial Systems Applications is a plus.
- **DATA ANALYSTS** with a minimum 3 years experience in Relational Database development and design, as well as excellent data modeling, analysis and communication skills. You will provide expertise and support to application development teams in the analysis and design of subject-area databases. Client/Server and Distributed Processing background helpful.
- **PC PROGRAMMERS** with a minimum 3-5 years experience using C, C++, WINDOWS NT, SYBASE and ORACLE in a development environment.

FDC offers a competitive salary structure and outstanding benefits featuring Life/Medical Insurance, Dental, Vision, Legal, 401(k), Retirement, Stock Purchase Plans, Tuition Reimbursement, Career Guidance, Relocation and more. **Qualified candidates may send or FAX (402-222-6464) resume indicating position of interest to: Wade L. Haught - Manager Technical Recruiting**

First Data Card Services Group
10826 Farnam Drive (T-12)
Omaha, NE 68154

FIRST DATA CORP.

FIRST DATA CARD SERVICES GROUP

Affirmative Action/ Equal Opportunity Employer M/F/D/V

MAINFRAME JOBS !

Our U.S. clients have CURRENT needs for:

P/A's
CICS DB2 IMS

DBA's
DB2 ORACLE IDMS

P/A or S/A's
Vantage or Life Insurance

SYSTEM PROG.
MVS CICS DB2

ROBERT SHIELDS & ASSOCIATES
P.O. Box 890723, MIS
Houston, TX 77289-0723
800/423-[illegible]
FAX 713/486-1496
MISJOBS@AOL.COM

PRODATA INC. **Salt Lake City, UT**

INFORMATION SYSTEM CONSULTANTS

PRODATA is one of the nation's premier System Integration & Information System consulting firms, serving 8 Western regions in a wide variety of Mainframe, Midrange, and Client Server applications.

We seek a **Consulting Manager** and a **Recruiter** to join our **Salt Lake City** staff to help manage our growing success. Both individuals should possess a strong understanding of hardware & software platforms, tools, methodologies, & standards ***and*** the ability to work in a "vertically flat" organization with dynamic environment and minimal bureaucracy. Specifically:

Sr. Consulting Mgr: 10+ yrs. DP, 5+ yrs. marketing IS consulting services to Industry & Government, 3rd party/VAR experience, & Account/Project role with profit center responsibilities.

Recruiter: formal H.R. background recruiting for MIS/DP functions, prefer 3+ yrs. with IS Consulting/Service firm.

For more information, please contact: PRODATA, 1100 E. 6600 S., Suite 200, Salt Lake City, UT 84121. 801-266-6138 FAX 801-266-0069

SOFTWARE ENGINEER: 40 hrs./wk. 8am-5pm, $46,000/yr. Perform requirement definition, functional analysis, technical design, writing of program specifications, coding & testing of programs on an IBM 3090 mnfrm comptr utilizing DB2, COBOL II, IMS, TSO, ISPF, DMF & JCL s/w. Req: Bachelor's degree in Comptr Science, Electronics Engnrng or Equivalent (Equivalent includes 4 yrs expr in job offered or 4 yrs. expr in related occupation in lieu of Bachelor's degree), 2 yrs. expr in job offered or 2 yrs. expr as Systems Analyst/Programmer. Work expr in developing s/w programs on IBM 3090 mnfrm utilizing DB2, IMS, COBOL or COBOL II & TSO. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref No: 101304

Programmer/Analyst (Houston, TX area client site). Develop, code, test, implement and maintain programs for financial and commercial applications systems, using CSP, COBOL and DB2 on IBM mainframes. Bachelor's degree in Comp. Sci., Math, Engineering, or Business Admin. and 2 yrs. exp. in job req. 40 hrs/wk, 8:30-5, $36,500/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O. #TX7211737. Ad Paid by an Equal Opportunity Employer.

CONSULTANTS SHOULD CONSULT

MIMI

IMMEDIATE CONTRACTS

Please send resume & call
Mimi Simon Assoc
[illegible]
(212) 406-1705
FAX (212) 406-1768

Carolinas Southeast

[illegible]

CSC

[illegible]

O'BRIEN & COMPANY

INFORMATION ENGINEERING

PRINCIPAL SYSTEMS CONSULTANT (internal) Lead, facilitate BAA, BPR, workflow analysis [illegible]

CASE TOOLS SUPPORT Install, configure, test PC based tools on OS/2 DOS Windows platforms. CASE experience preferred (SEER, BACHMAN, MEDIATOR, PACBASE etc.)

303 So. Lexington Pkwy., St Paul, MN 55105-2926. voice: 800-936-2129 fax: 612-690-1526.

Christian Broadcasting Network

Information Systems Development Manager

The successful candidate will have Extensive experience in systems analysis and design in a marketing/sales environment, experience in software systems development, experience programming in Fox-Pro and utilizing relational database technology. Masters degree preferred. CBN is located in Virginia Beach, Virginia. If you share our vision, call us at (800) 888-7894 to request an application.

NETWORK OUTSOURCING: Second time's a charm

By Joanne Cummings

■ When it comes to network outsourcing, users say, the second time's a charm. But watch that first step; it can be a doozy.

Take Butler Service Group, a recruiting firm in Montvale, N.J., for example. When it moved from a Wang Laboratories, Inc. VS t00 with dial-up connections to an IBM AS/400-based dedicated network linking more than 50 remote sites, it decided to outsource the new network. "I didn't have the personnel, the time or the [money] to call up AT&T or whomever and say, 'I want a line from here to here,'" says Alethea Pratt, vice president of management. "I didn't want to be responsible for any of that stuff. That's not what I want to do with my life."

Butler's current outsourcer, Memphis-based Cylix Communications Corp., handles everything from line maintenance and troubleshooting to performance reporting. "It has worked out very nicely the second time around," she says. "I had some problems with [my first] carrier, which shall remain nameless."

With its first choice, Butler had problems with lines going down, unresolved trouble tickets and poor problem-reporting. "They didn't know what the problems were," she says. After dumping them, Pratt says her firm was much savvier in selecting vendor No. 2.

Pratt suggests verifying the outsourcer's expertise. "Make sure [they're] adept in data lines," she says. "Just because they're in voice doesn't mean they know what they're doing in data."

The contract should also spell out the required network uptime. "If you're going to be savvy, negotiate a clause that requires the outsourcer to have a certain percentage of uptime," Pratt says. "And if they're not up for that period of time, penalties should be involved."

Richard Bowman, director of global operations at Citicorp Dealing Resources, Inc., a New York-based financial trading services firm, agrees. "You must decide whether you need 30-second notification of an outage and make sure that's spelled out."

Citicorp Dealing, which outsources its entire t,000-site global financial trading network, is also on its second outsourcer, Digital Equipment Corp. The first didn't work out. "Let's just say our idea of network monitoring was different from theirs," he says. "They didn't understand the spirit of the contract and didn't meet the letter."

When shopping around for a vendor, Bowman warns against assigning the job to a network staffer.

"I don't recommend [putting] the guy who's run the network for the past 20 years in charge," Bowman says. "He's not an expert in forming contracts or managing vendor staff." Instead, find a consultant who's been through the process. "If your risk of failure is great, and it usually is, doing it completely in-house is probably not the best way."

The way to go

It's also important to have some control over the outsourcer's staff. "You must meet the senior people in the organization and make sure their heads and hearts are in the right place," Bowman says. "Also, be sure you get first refusal for any promotion or replacement of [your] primary contact."

Although both Pratt and Bowman were burned the first time, neither would reconsider their decision. Bowman says he likes leveraging the outsourcer's staffing expertise. "We're in about t5 different countries, and it's hard to keep on top of the different issues with each [Post Telephone & Telegraph administration]. I would need a number of people on staff to handle something like that, and that would be expensive."

"I definitely recommend [outsourcing] to anybody who's struggling to do this. Nobody's chasing after line problems," Pratt adds. "If a line goes down, they route the thing around and the dial backup comes back up again, and I don't even know it." ■

Cummings is a free-lance writer in Marlboro, Mass.

OUTSOURCED RESOURCES

(Percentage of companies outsourcing or considering it)

	Summer 1991	Winter 1993
Mainframes	12.3%	14.2%
Midrange	3.7%	6.2%
PCs	7.7%	7.7%
Data networks	8%	8.5%
Application development	0%	15%
Other	1.8%	9.6%

Multiple responses allowed. Base: 1,200 respondents

Source: The Outsourcing Institute, New York

DON'T FORGET

Plan for growth.
"You have to make sure that you get a contract that will allow you to move up the line," says Alethea Pratt, vice president of management at Butler Service Group. "So if you start out at 9.6K, you can move up to 56K and 19.2K and so on without any pain."

Seriously consider dial backup.
"Just don't assume that the lines will be there all the time," Pratt says.

Match personalities.
"You wouldn't hire an employee you didn't like, so why should you be forced to work with one at your outsourcer?" says Richard Bowman, director of global operations at Citicorp Dealing Resources.

Avoid overmanaging.
"You're paying an outsourcer a lot of money to do things, so don't try to manage that outsourcer as if he were on your own staff," Bowman says. "Manage by exception. Identify what's critical and then set thresholds. Once the threshold is exceeded, that's when you step in."

Coming Soon...
Marketplace Information Center!

It's the unique, new service designed to help Computerworld Marketplace readers – key users and buyers of information technology – get important product/service information – fast.

And It Can Work – for You! Because...
...Every call gets answered immediately – you get no busy signals, unanswered calls, or answering machines.
...Every call generates immediate turnaround of the specific product/service information *you* request.
...Every call is free to you.
...And because the Marketplace Information Center is user friendly!

Look for the Toll-free Number – Then Give Us a Call. Trained Specialists Will Be Standing by...Waiting To Help YOU!

Networking Hardware

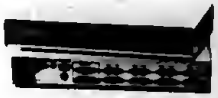
CONTROL
ALL YOUR PC SERVERS

FROM ONE KEYBOARD, MONITOR AND MOUSE

with *MasterConsole*®

COMPARE QUALITY AND PRICE PERFORMANCE

- Save Space, Cut Costs & Centralize Control with *100% Reliability*
- "Plug and Play" Any Mix of PCs & All Video Supports PS/2 Mouse & Serial Mouse
- Desktop or 19" Rack Mount Models for 2, 4, 8, 16, PCs. Expand to 64
- Keyboard & Mouse Emulation Insures Error Free PC Operation & Automatic Booting
- AUTOSCAN™ to Monitor All PCs
- Remote Access up to 150 Feet
- Thousands in Use Worldwide GSA Schedule for U.S. Fed. Govt.



See us at Networld & Interop '94 Atlanta Booth #678 and Networks Expo Dallas Booth #1178

"No other solution stacks up."

CALL TODAY!
(908) 874-4072 x 39

RARITAN COMPUTER INC.
10-1 ILene Court, Belle Mead NJ 08502 FAX (908) 874-5274

RCI

30 DAY MONEY-BACK GUARANTEE 1-YEAR WARRANTY

Network Security & Wireless Bridges

Cylink has the world locked up.

You *can* secure your information globally You just need the right security partner. Only Cylink has spent the last ten years building a support organization in over 80 countries—working successfully with local governments, customs, and communications infrastructures. We can secure everything from applications on a laptop to global wide-area networks, from telephones to high-speed data links We secure information for most of the world's money center banks, Fortune 500 companies, and government, police, and military organizations Because of our experience, it's easier than you think to keep your information safe. Cylink Corporation, 910 Hermosa Court, Sunnyvale, California, USA, 94086. Telephone: 408-735-5800, FAX: 408-720-8294, Toll-free (USA): 800-533-3958. Worldwide sales & support.

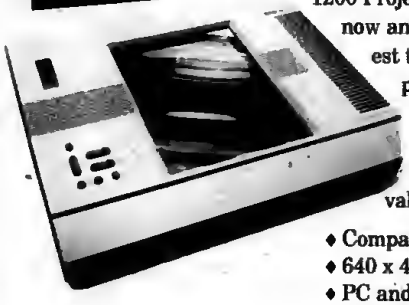
England: Cylink, Ltd., Hampshire—TEL +44-256-847919 • FAX +44-256-24108
Singapore: Cylink Corporation—TEL +65-336-8677 • FAX +65-334 1439
© 1994 Cylink Corporation. Cylink is a registered trademark of Cylink Corporation

CYLINK

Computer Presentations

Bright color. Bright price..
$2,299.

SPECIAL OFFER!



The New BOXLIGHT ColorShow 1200 Projection Panel. Call now and order our brightest true-color LCD panel at the special introdutory price of only $2,299. It's an unbeatable value-guaranteed.

- Compact & portable
- 640 x 480 resolution
- PC and MAC compatible
- Free remote and cables

Your direct source for all the bright answers.
- Widest selection
- Instant availability
- Overnight shipping
- 30-day guarantee

BOXLIGHT™ CORPORATION

Call Today 1-800-769-5757

Mainframe Connectivity

FREE!

NEW BrxX3270 DEMO DISK

3270 SNA Emulation Software for Windows™

Access IBM mainframe applications from your PC.

- 3270 and Telnet 3270 clients for Windows 3.1
- File transfer and print
- Point & click programming
- 100% Winsock-compliant
- Graphical keyboard mapper
- Allows interactiva query of applications like TSO, CICS, IMS, and NetView

CALL 1-800 BRI TON

MARKETPLACE

Information Management

LAN OFFSITE

Computer Tape Backup, Highly Secure Offsite Vault Storage, Disciplined Automatic Rotation and Retrieval, ALL IN ONE

SafeNet

PC remote backup
Your best defense
A system of
storage & automatic

SafeNet offers
vital business
failure, fire, flood, or any
level security, temperatu
toring along with halon fi
Safesite's 5000 clients nationwide
this new service for

Guarantee delivery of
our data vault
Pay for 11 months
month of FREE SERV

1-800-833
Daily - $20.00

SAFESI

National Business Records

COMPUTERWORLD's

"5th Wave" Cartoon Mouse Pad

COMPUTERWORLD brings humor to a mouse pad featuring a new cartoon from "The 5th Wave" series by Rich Tennant. Not available in stores, this colorful foam-backed pad will keep your mouse clean and protect your desktop.

Best of all, it's only $7.99*. Send your name, address and check or money order to COMPUTERWORLD, P.O. Box 9171, Framingham, MA 01701, Attn: Product Fulfillment

For credit card orders, call 1-800-343-6474

*In U.S., for each unit ordered, add $1.25 for postage and handling; orders outside U.S. add $2.50 each. Residents of MA, CA, GA, NJ, and DC add applicable sales tax. Canada residents add G.S.T.

Connectivity Software

BW-MultiConnect for Windows NT

Turns Windows NT into a NetWare server for DOS & Windows clients.

Trademarks are the property of their respective owners.
Tel (919) 831-8989. Fax (919) 831-8990. ©1994 Beame & Whiteside Software, Inc. (057D)

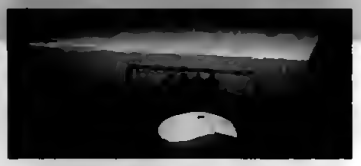
- - - - On The Info Hwy. With Carl & Fred by Blick - - - -

File Server Cabinetry

Concentration

The world's two best switching systems.

The APEX Desktop Concentrator



4 and 8 port models

The smartest way to reliably attach and control a vast network of computer systems using a single keyboard, mouse and monitor.

Intelligent operation maintains connections across up to 64 computer systems without costly expansion modules or expensive custom cables. Ensures unattended system restart after power failures.

Knowledgeable support. Apex's decade of experience with system integration enables you to dramatically boost efficiency and productivity.

Innovation & Technology by Design

Made in U.S.A

For more information call: 1-800-861-5858
4580 150th Avenue NE • Redmond, WA 98052 • Fax: 206-861-5757

APEX PC SOLUTIONS

Computer Presentations

Power Tools for the Power Presenter

One stop shop for all major brands

For the latest in color projection panels and projectors call the experts in LCD technology. Your satisfaction guaranteed or your money back. Quick delivery via Fed-X or UPS.

Call for CATALOG 1 800 726 3599

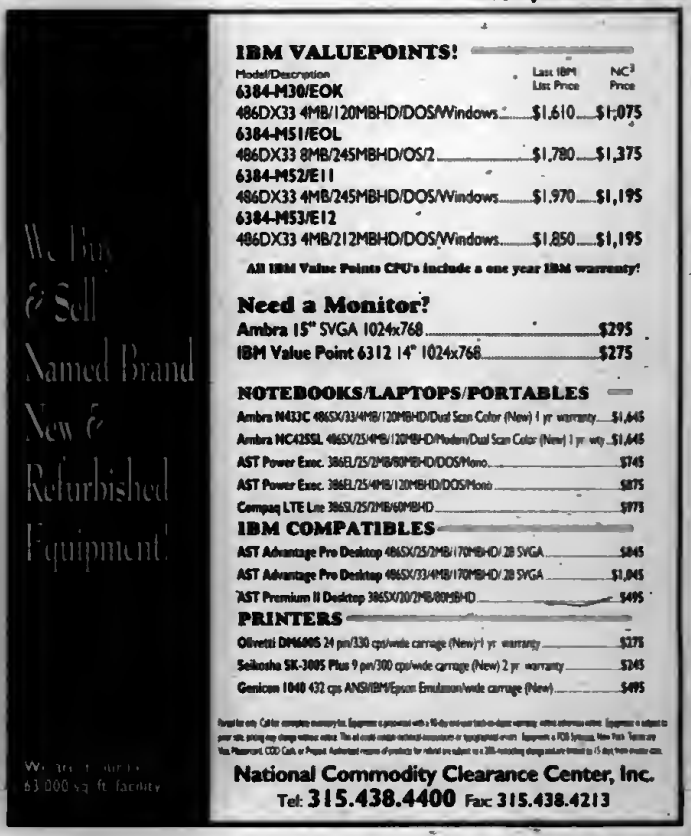
nelight

101 The Embarcadero Ste. 100-A, San Francisco, CA 94105
Hours: 6:30 to 5:30 PST, 9:30 to 8:30 EST
VOICE: 415 772 5800 FAX: 415 986 3817

MARKETPLACE

Networking Management

Computer Products



Offshore Programming / Software Development

COMPUTERWORLD's

"5th Wave" Cartoon Mouse Pad

COMPUTERWORLD brings humor to a mouse pad featuring a new cartoon from "The 5th Wave" series by Rich Tennant. Not available in stores, this colorful foam-backed pad will keep your mouse clean and protect your desktop.

Best of all, it's only $7.99*. Send your name, address and check or money order to **COMPUTERWORLD**, P.O. Box 9171, Framingham, MA 01701, Attn: Product Fulfillment

For credit card orders, call 1-800-343-6474

*In U.S., for each unit ordered: add $1.25 for postage and handling; orders outside U.S. add $2.50 each. Residents of MA, CA, GA, NJ, and DC add applicable sales tax. Canada residents add G.S.T.

SAVE 50-75% ON PROGRAMMING

With American Management and C.I.S. Technical Expertise

1-800-499-0888

- *SuperComputer Services*
- *Applications Development*
- *Client-Server Programming*
- *Unix, Windows, Macintosh*
- *Advanced R & D*
- *Platform Migration*

And much, much more!

We're a US Company with brilliant programmers in the C.I.S. Working closely with your staff, we will become an extension of your IS Team. All services provided under the most stringent security guidelines.

TYPHOON SOFTWARE

6 East Arrellaga Street, Santa Barbara, CA 93101-2502 USA Ph (805) 966-7633
Fax (805) 962-6811
Internet typhoon@sovusa.com

Buy / Sell / Lease

Dempsey: Where IBM® Quality is Second Nature!

- AS/400
- INDUSTRIAL PC
- RS/6000
- SYSTEM/36
- SERIES/1
- 9370
- ES/9000
- PS/2 & VP

Sales & Rentals
- Processors
- Peripherals
- Upgrades

For preleased equipment, flexible financing, configuration planning, technical support and overnight shipping call.

Dempsey BUSINESS SYSTEMS
18377 Beach Blvd., Suite 323 • Huntington Beach, CA 92648
(714) 847-8486 • FAX (714) 847-3149

IBM Authorized Dealer Products Integrator

IBM is a registered trademark of International Business Machines Corporation

(800) 888-2000

MARKETPLACE

Buy / Sell / Lease

IBM Systems • Peripherals • Parts & Service

NEW & USED IN STOCK

- RISC System/6000
- Workstations
- Parts & Features
- AS/400
- Novell Networking
- Sun & Dec
- Personal Computers
- Data Communications
- UPS Systems
- Peripherals & Upgrades
- System 36 Conversion
- AutoCad

Authorized Distributors for: Seagate • Xerox Kingston • Cal Comp Motorola • UDS/Codex Decision Data Products

8 Nationwide Locations

A Publicly Traded Company NASDAQ MKPL

Computer Marketplace prides itself on being your one-call computer hardware solution.

COMPUTER MARKETPLACE

800-858-1144

TEL (909) 735-2102 • FAX (909) 735-5717
1490 Railroad Street • Corona, CA 91720

CBE

Large Systems Computer & Peripherals

IBM

- ES/9000
- SERIES/1
- AS/400
- RS/6000
- SYSTEM/88
- Point Of Sale

...and more!

New & Used

- *Computers*
- *Peripherals*
- *Upgrades*

Buy • Sell • Rent • Lease

SPECTRA
(800) 745-1233
(714) 970-7000 • (714) 970-7095 Fax

Anaheim Corporate Center
5101 E. La Palma Ave., Second Floor
Anaheim, CA 92807

amdahl
Cisco
Concurrent
Data General
digital
Hitachi
HEWLETT PACKARD
Memorex-Telex
Prime
Silicon Graphics
Stratus
Sun
TANDEM
TEXAS INSTRUMENTS
UNISYS
XEROX

Large Systems Computers & Peripherals

BUY • SELL • RENT • LEASE

- Amdahl
- Cisco
- Concurrent
- Data General
- Digital Equipment
- EMC
- Hewlett-Packard
- Hitachi
- IBM RS/6000 • AS/400 • Mainframe
- Memorex-Telex
- NCR
- Prime
- Sequent
- Silicon Graphics
- Stratus
- Sun
- Point of Sale and more
- Tandem
- unisys
- Wyse
- Xerox

(800) 729-3280

SERVTEK COMPUTERS
180 Newport Center Drive, Suite 265
Newport Beach, CA 92660
(714) 729-3280 • (714) 729-3288 Fax

Outsourcing

If Outsourcing is your objective...

You can maximize your information technology investment by outsourcing part – or all – of your IS operation. Whether it's a transitional or long-term total services partnership, American Software's the right place to rightsize.

Even software developers enjoy the cost and time-saving benefits of outsourcing with us. Call today and we'll tell you why.

®*The Outsourcing Group*
A Unit of American Software USA
470 E. Paces Ferry Road
Atlanta, GA 30305
404-264-5770

Outsourcing / Remote Computing

ALICOMP, INC.

The "Boutique" of the Computer Services World

Outsourcing Remote Computing

VM, MVS, VSE

Two State of the Art Locations:

ALICOMP / CBS

20,000 sq. ft. Manhattan complex 105,000 sq. ft. Secaucus, NJ complex

"Our Platform is Excellence"

Serving Clients Since 1980

(212) 886-3600 • (800) 274-5556

Time & Services

Most Vendors
have well-equipped data centers...

They have large systems with the software you need, plenty of MIPS, and UPS systems.

Only one will exceed your expectations!

- Only one runs your work as its own.
- Only one minimizes your risk and maximizes your cash flow.
- Only one will get the job done totally.

CSC CompuSource – dedicated to outsourcing since 1980.

You're in control when you put on in control!

CSC

CompuSource
A Unit of Computer Sciences Corporation

110 MacKenan Drive
Cary, North Carolina 27511

Outsourcing / Remote Computing

Your best choice for mainframe computing services

REMOTE COMPUTING

Extensive Software Library

Telenet Tymnet
Advantis Compuserve

MVS/ESA IMS/DBDC
VM/ESA CICS SAS
VSE/ESA TSO DB2

Extraordinary Customer Service
Migration Management

708-574-3636
New England 617-595-8000
815 Commerce Drive, Oak Brook, IL 60521

FANEUIL SYSTEMS

BUY • SELL • LEASE • RENT • NEW • USED • ALL BRANDS & MODELS

UNBEATABLE FOR UNIX & RISC!

ALPINE COMPUTER SALES

UNIX- & RISC-BASED WORKSTATIONS
- IBM RS/6000
- IBM RT - 6150
- HP 3000/9000
- SUN MICRO
- SGI
- DEC/VAX/ALPHA
- DATA GENERAL
- BULL
- ALL OTHERS

SYSTEM UPGRADES
- MEMORY
- CONTROLLER BOARDS
- DISK DRIVES
- GRAPHICS UPGRADES
- RAID SYSTEMS
- TAPE DRIVES
- PROCESSOR UPGRADES
- ADAPTERS OF ALL KINDS

ALL BRANDS & MODELS
- SYSTEMS
- FEATURES
- DISPLAYS
- TERMINALS
- RAID SYSTEMS
- MODEMS
- MASS STORAGE
- PRINTERS & PLOTTERS
- X-STATIONS
- CONNECTIVITY
- ALL PERIPHERALS

NETWORK BUY/SELL
- IBM
- ANDREW
- BLACK BOX
- CABLETRON
- CANOGA PERKINS
- CHIPCOM
- CISCO
- MADGE
- NETWORTH
- PROTEON
- SYNOPTICS
- WELLFLEET

☆ TOKEN RING & ETHERNET CARDS

702-782-5208
FAX: 702-782-5244

800-853-5208

Successful Advertisers Have One Important Thing in Common: Computerworld Marketplace

"Computerworld Marketplace advertising definitely gets the right companies to call. We consistently receive top-quality leads and typically convert over 10% into sales contracts."

Arthur Kurek, President
Lorraine Drake, Executive Vice President
ALICOMP, INC

ALICOMP, INC.
The "Boutique" of the Computer Services World
Outsourcing Remote Computing
Our Platform is Excellence

Computer Training

FREE PC TRAINING CATALOG

Why use one method to train your staff on Windows, DOS, Macintosh, UNIX or any other software application?

Our catalog includes hundreds of videos, software tutorials, multimedia and classroom courseware products... guaranteed to appeal to every type of learner.

Choose from **more than 3000 products** that will save you money on end user and systems training.
No personal or dealer inquiries.

Call Elin today and see how we can help you maximize your training dollars.

800-363-5611

Elin Computer Resources, Inc.
100 Walnut Street, Champlain NY 12919
Fax 514-483-1754 Int'l 514-483-4641

In September,

Your Best Technology Solutions Are Just a Handshake Away!

Looking for Proven Technology Solutions?

No problem... when you do your shopping at Networks Expo in Dallas. That's because you'll have the opportunity to shake hands with some important business partners. Computerworld Marketplace advertisers, to be exact. Marketers just waiting to tell you about their products and services - for desktop computing, workgroup computing, enterprise networking, large systems, and application development. And, most importantly, how you can put them to work - for you.

So stop by their booths, introduce yourself, and explore what they have to offer. And don't be surprised when you find your very best product/service providers ever.

Be Sure To Meet This Marketplace Advertiser... They'll Be Exhibiting at Networks Expo in Dallas, TX September 20 - 22:

Company	Type of Business	Booth Number
Raritan	Networking Hardware	1178

COMPUTERWORLD Marketplace
The Product Classified Source for IS Buyers

COMPUTERWORLD Marketplace

Watch your leads for stretching your ad budget with our choice rates! Join Computerworld Marketplace Account Executive Jim Gill the colorful circuit—call today.

Phone 800-343-6474, ext 744

Midwest
T-Jay Sewell
Colorado
Illinois
Minnesota
Montana
Nebraska
New Mexico
North Dakota
South Dakota
Texas
Utah
Wisconsin
Wyoming
Alberta
Manitoba
Saskatchewan

South Atlantic
Kevin Gasper
Alabama
Arkansas
Florida
Georgia
Iowa
Kansas
Kentucky
Louisiana
Mississippi
Missouri
North Carolina
Oklahoma
South Carolina
Tennessee
Virginia
West Virginia

New England
Susan Cardosa
Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont
New Brunswick
Newfoundland
Ontario
Quebec

Northwest
Andrew Sandoval
Alaska
Idaho
Northern California
Oregon
Washington
British Columbia

Southwest
Claude Carbonne
Arizona
Nevada
Southern California

Mid Atlantic
Michele Reeves
Delaware
Indiana
Maryland
Michigan
New Jersey
New York City
Long Island
Ohio
Pennsylvania
Washington D.C.

Bids & Proposals

SORT ON A PC LIKE ON THE MAINFRAME. DISK $10 ZSORT

Box 12238
Lexington, KY
4058-2238

Bids & Proposals

MS CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by CDPA 301 N. Lamar St. 301 Bldg Suite 508 Jackson MS 39201 for the following:
RFP 2646 due Thursday October 13, 1994 @ 3:30 P.M. for the acquisition of packaged microcomputer-based adult literacy and workplace literacy educational systems for the Mississippi State Department of Human Services, Department of Jobs, Opportunity and Basic Skills (JOBS). No Charge Vendors may request RFPs with no charge by calling Linda Watkins at (601) 359-2604. CDPA reserves the right to reject any/all bids and to waive informalities.

What's the Best-read Newsweekly among IS Professionals?

Simmons Says...Computerworld. Again.

Call for Complete Details!

Computerworld Marketplace

Call

1-800-343-6474, ext 744

MARKETPLACE

Novell YES Partners DIRECTORY

yes
It runs with NetWare

The Novell YES Partner's Directory

Appearing every week in Computerworld Marketplace, the Novell YES Partner's Directory is a separate advertising section dedicated solely to registered Novell YES Partners - hardware vendors, software vendors, and third-party developers/service providers specializing in the areas of applications, networking, hardware, and other software products. If you're a YES Partner with solutions to sell, call 800/343-6474 ext 744. Then watch the Partners Directory go to work for you!

Virus / Security Protection

VIRUS and Security Protection

Can You Sleep At Night Knowing You Don't Have All This?

EMD Armor™

PC and **Network Protection**. Stops **Boot Viruses** Hard Disk Protected from **Virus Formatting** Continuous **Virus Activity Monitor** Correct **Power Up** Insured by CMOS Protection **Virus Protection** During File Copying/Executing **Password Protection** and **Access Control** Prevents Removing Viewing Changing Or Using Private Files. Conventional **Memory Not Used!**

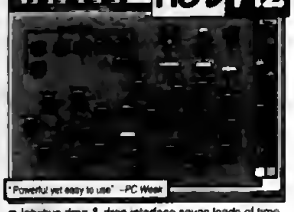
No RISK 30 day money-back guarantee

EMD Enterprises (410)583-1575,ext3020

Fax Back extension 4, document #1015

Network Diagram Tool

Diagram, document networks & systems with netViz



"Powerful yet easy to use" –PC Week

- Intuitive drag-&-drop interface saves loads of time
- Embed descriptive data within graphic objects
- Multi-level capability handles complex structures

Free demo version of netViz!

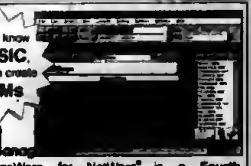
- CompuServe: GO WINAPO, download file NVDEMO.EXE
- Internet: Send message to fpserver@ns.com (no subject needed), message contents "get nvdemo.exe". File will be sent to you
- After download: At DOS prompt type "nvdemo". From Windows, run "setup"

$395 30-day money back guarantee

1-800-827-1856 Quyen Systems, Inc.

Network Mgmt Language

If you know BASIC, you can create NLMs



ManageWare for NetWare® is a **Fourth Generation Language** (4GL) similar to **BASIC** and it allows you to create network applications that run on both file servers (NLM) and workstations. Designed specifically for NLMs and network utilities, ManageWare provides **full access** to NetWare internals and creates (compiles) stand alone, royalty free NLMs or EXEs. So develop and test applications under Windows® and enjoy features such as user-definable programming templates and drag-and-drop of reusable codes. Includes source code for many popular utilities such as FCONSOLE, PSERVER and VOLINFO. Supports NetWare versions 3.x-4.x. **Only $295 - SDK $695**

Now features open architecture for access to C routines and Btrieve support.

NITEC

TEL-(602) 970-1025
FAX-(602) 970-6323

yes NetWare Tested and Approved

3370 N. Hayden Rd. Suite 123-175 Scottsdale, AZ 85251-6696

Looking To Buy NetWare Products and Services?

If the Answer Is "Yes," Look No Further.

Because...every week, you'll find just what you're looking for – right here. In the NEW Novell YES Partner's Directory in Computerworld Marketplace.

Just Pick Up the Phone – and Say "Yes!"

It's that easy. All you have to do is find the NetWare products and services you're looking to buy – then call those Novell YES Partners and say "Yes!"

These hardware vendors, software vendors, and third-party developers/service providers specialize in applications, networking, hardware, and other software products. And they're waiting to say "Yes" to you by helping you find the NetWare products and services you need most.

- AS/400 connectivity
- Database connectivity
- Development tools
- E-mail connectivity
- 3270 emulators
- Internetworking
- Network management
- Print services
- Software distribution
- Value-added OEM hardware
- Vertical applications
- Plus others!

Week after week, you'll find more and more of these NetWare products and services advertised right here. So turn to the new Novell YES Partner's Directory in Computerworld Marketplace – every issue – and say "Yes!"

Looking for...

...Application development tools from an experienced developer?

The AD Toolbox has just what you're looking for ...flexible, portable, and maintainable tools for your environment/platform. Simply locate the developers providing your solutions - and give them a call.

And, if you're a developer with solutions to sell,
call 800/343-6474, ext 744
Then watch the AD Toolbox go to work - for you!

APPLICATION DEVELOPER'S TOOLBOX

WINDOWS IMAGING

IMAGE BASIC

SCANNING OCR DISPLAY BAR CODE VISUAL PROGRAMMING

Imaging Magazine Product of the Year

- Customize ALL aspects of your imaging system
- Bundle home processing capabilities
- Imaging toolkit components are in use by over 100,000 users
- 30-day money back guarantee eliminates risk of trying product

DIAMOND HEAD SOFTWARE, INC.
Call: 1-800-BTOOLS Fax: (808) 545-7042

MS-DOS

Royalty-Free DOS Extender!

Plus a Windows linker and DOS dynamic overlay linker, all in one product for the same price!

Why use a multitude of programming tools when one will do? BLINKER 3.0 features a fully-functional DOS extender to directly access up to 16Mb of extended memory, the world's fastest Windows linker **and** the fastest dynamic overlay linker to automatically design and manage overlays within 640KB. You can even create a single ***dual mode*** program to automatically run in either protected mode or real mode, depending on the runtime machine's resources. Compatible with C, C++, CA-Clipper, FORTRAN, Assembler, etc. BLINKER saves hours of valuable programming time.

- **No risk, 30 day money-back guarantee**
Order BLINKER 3.0 today for only $299
FREE DEMO disk available on request

Blinker

Call Now 804-747-6700 Or FAX to 804-747-4208

POWERBUILDER TOOLS

PROFESSIONAL

ObjectStart from Greenbriar & Russel Software can make you a more popular developer. With a comprehensive class library containing over 100 reusable objects including GUI controls and security objects, this tool lets you build MDI applications at lightning-quick speeds. It frees you to think about the functionality of your applications (the fun stuff) rather than how to make them run (the boring stuff).

With ObjectStart, each application will have consistent development structure. This permits the standardization of all applications and simplifies maintenance and documentation. ObjectStart even comes with an application generator that builds a working MDI application.

Created by Greenbriar & Russel, recognized leaders with client/server technology, ObjectStart is a complete PowerBuilder Object Tool Kit that turns ordinary techno-geeks into a supercharged techno-genius.

Any questions?
Managers: Call for a free cost/benefit analysis.
Techno-geniuses: Just ask for the free demo disk package.
800-483-8347 ext 501

ObjectStart
From Greenbriar & Russel, Inc.

OBJECT ORIENTED

Learn C++ & Windows-Based Programming...
Simply, Quickly!

With the OML Learning Series™ you can learn C, Visual C++™, object technology and Windows™-Based programming quickly and conveniently in the privacy of your home or office.. The OML Learning Series features:.

Visual Series™, C/C++ Series™ OOA/OOD Series™, OLE Series™

Each series: $245* (reg $400)
Any 2 series: $395* (reg $750)
Any 3 series: $545* (reg $1050)
All 4 series: $645* (reg $1300)
LAN version: Call
* Limited Time Offer

MONEY BACK GUARANTEE 30 DAY

Call us for information and FREE Demo Software.

800-6789-OML

Ask about our low cost LAN package

Object Management Laboratory
TEL 818-879-9630
FAX 818-879-1860

OML LEARNING SERIES
Object Technology Made Simple

WINDOWS IMAGING

IMAGING developer toolkits
What the experts say...

"...If you need top-notch color support, consider LEAD's terrific 24-bit toolbox."
-Imaging Magazine March 1994

"We chose LEAD's JPEG and CCITT compression technology over other available solutions for its image quality, ease of integration and speed performance."
-Dr. Michael Cleveland, President and CEO, Corel Corp.

"...great compression without using the lossy techniques of other high-compression algorithms."
-PC Magazine March 15, 1994

LEADTOOLS is the choice of over 2,000 developers including Corel, Sharp Electronics, Kodak, Xerox and Truevision. LEADTOOLS has the most formats, the most formats. Call today for complete information!

30 day risk free trial – FREE demo disk!

1-800-637-4699

LEAD Technologies, Inc. • Charlotte NC 28202
704-548-3552 • Fax: 704-548-4181 • CompuServe: GO LEADTECH

MS-DOS

Lahey

FORTRAN
New! 32-Bit Fortran 90
FORTRAN 77 Professional and Student Versions
New Code or Downsizing
Complete Suite of Tools
Free Technical Support
A Decade of PC Fortrans
(800) 548-4778 or (702) 831-2500
Fax: (702) 831-8123

SECURITY

Protect Your Software and Revenues

Stop piracy - Increase revenues. Sentinel® is the world's leading software protection solution. Call today for your Sentinel Developer's Kit!

SENTINEL Securing the future of software **800-852-8569**

Rainbow Technologies, Inc. fax: 714-454-8557

WINDOWS COBOL TOOLS

COBOL for the 21st Century

Modernize your COBOL applications and take advantage of the most sophisticated enhancements to COBOL development, including:

- **Graphical User Interfaces (Windows and Windows NT)**
- **Fast compile times — fastest among leading COBOLs**
- **Portability across over 600 platforms**
- **Fully integrated development tools**

Take your organization into the 21st century. Call Acucobol today at 800-COBOL-85 or 619-689-7220. Or fax us at 619-689-7254.

acucobol inc

PROGRAMMING HURDLES Getting You Down?

You've Turned to the Right Place!

Because...every week, you'll find the right tools for the right jobs – right here.

Developer's Toolbox

- **Tools to build applications that are portable across a multitude of platforms.**
- **Tools that speed application development and make programming much less painful.**
- **And tools for mission-critical applications that improve your organization's competitiveness.**

So turn here again next issue – and every issue – for expert help in overcoming your programming hurdles!

DATA ENTRY SOFTWARE

-OUT VIKING DATA ENTRY

Before replacing yours, check-out the **Viking Data Entry (VDE) System.**

Half of *Fortune* magazine's top 50 companies, numerous U.S. and foreign government agencies, and data entry service bureaus worldwide have discovered the benefits of **VDE:**

- **Faster, easier keyboard entry and verification**
- **Insure accuracy with advanced data validation**
- **Multi-platform: MS/DOS, UNIX, VMS**
- **Save costs ... replace mainframe data entry**
- **Real-time "Customer Care" support**

Call now for our *VDE Features & Functions Checklist*
Compare VDE features with an existing system or one you're considering buying.

Viking Software Services, Inc.
800-324-0595
Ph:918/491-8144 • Fx:918/494-2701

WINDOWS DBMS TOOLS

SixBase/VB
Makes Windows F-A-S-T!

How Fast? Well, how about 40 TIMES faster than other Windows data-engines. That's SPEED! Add that to SixBase's multi-user database support (including Fax/IDX-FPT & Clipper/NTX-DBT) Encryption, Query-optimization and our Very MDI Browse/Grid and Data-aware VBX controls and you've got the most action-packed Windows database engine around.

Now Only $149
(30 Day Money-back Guarantee)

(800) 683-1657
(909) 699-9657
FAX (909) 685-5679

SuccessWare Int'l.

Solutions Directory

401(k) ADMINISTRATION

DELTA DATA SERVICES, INC. . . . . . .
(800) 451-0100
Defined contribution administration software for the plan sponsor. Interfaces with payroll for administration of 401K, ESOP, thrift, and profit sharing plans. Daily or periodic processing, distributions, loans, ADP/ACP testing, user defined statements, voice response. Runs on AS/400. Client/server version available mid-1994

ACCOUNTING

M • A • S 90 EVOLUTION/2 Accounting Software at Discount Prices?
Pay *DISCOUNTED* prices for the premier accounting solution. Industrial strength G/L, A/P, A/R, Payroll (with multiple city/state taxation), J/C, P/O, Sales Order, Point of Sale, Inv Mgmt, Time & Billing, many others. Dos/Windows/UNIX platforms supported.
CORLOR Development, Inc. (905) 281-7151

APPLICATIONS CONVERSION

MIGRATION - CONSOLIDATION
SERVICES:
VSE to MVS Migrations/MVS Re-Design
Data Center Consolidations
DFSMS Migrations
Project Management
COBOL/VS to COBOL/II/370 Conversions
Systems Integration & Re-Design, Inc.
(504) 834-2253

APPLICATIONS DEVELOPMENT

APPLICATION DEVELOPER'S TOOLBOX
See proceeding page in Marketplace.

AS-400/CICS/UNIX/Client-Server applications
AMPERSAND CORP. . . . . . **(516) 548-0100**

Is your shop ready for the "Turn of the Century"?
. . . . . **(800) 999-0757**

Micro Focus COBOL/CICS/XDB/DB2
SilverStone Systems, Inc. NY . . (212) 786-4079

C++

C++ Training, Design, Emergency Code Repairs.
Rowe Technology . . . . . (408) 375-9449

CABLING SERVICES

Hi-Speed Printer Cables 30ft-200ft
Autotime Corp . . . . . (503) 452-8577

CLIENT SERVER DEVELOPERS

High performance OLTP design and implementation specialists. We utilize memory resident databases, Sybase SQL Server and Oracle, as appropriate on Windows NTAS, Stratus/VOS/FTX and UNIX Servers with either Windows or Unix Clients.
Developers Edge Ltd. 1-800-EDGE-SYS

Innovision Technologies, Inc.
(PowerBuilder Specialists) (313) 591-7472
Quality Client Server GUI Applications. Development/Testing using formal methodologies. OOA, OOD, OOP, Integration Testing, System Testing, Acceptance Testing, PowerBuilder, C/C++, Auto Testing, Oracle, Informix, Sybase, Ingres.

Millennium Computer Corp. "Quality Solutions"
On Schedule, Within Budget . . . (716) 248-0510

NIIT - Software Division . . . . (404) 804-6446
Developers of client server applications using Sybase and Oracle. Option for offshore software development available. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax: (404) 804-6445.

CONSULTANTS

FREE Technical Help on Oracle
DBA, SQL, Embedded SQL, Cobol under UNIX or MPE/IX. We may answer your short tech. question right on phone. Call 703-448-8484 Mon, Wed & Fri 6:30 to 9 PM EST. Better Fax 703-448-5639 (any time) before calling. Limited time offer

CONTRACT PROGRAMMING

For your every computing need... We are a storehouse of talent in ORACLE 7.0, SYBASE, POWERBUILDER, UNIFACE, IBM (CICS, DB2, VSAM, COBOL), UNIX, WINDOWS, C, C++.
Call us at **(908) 561-9196.**
Hexaware Technologies, Inc.

NASTEL Technologies
Prime source for cost effective, high quality, on-site/offsite software development. Expertise in Oracle, Informix, Sybase, Powerbuilder, Client Server applications, re-engineering (multimedia windows) and CAD conversions. Reliable delivery. Excellent References.
(212) 251-0787 Fax 212-689-4950

AS/400, RPG/400, S36, PRISM, CUSTOM APPS
Skyrise Designs, Inc . . . . . (503) 382-4786

DATA RECOVERY

RANDOMEX Data Recovery Service
Hard Drives - Tapes - Floppies - Disk Packs
Crashes/Power Failures/Viruses/Fire
Average Turnaround 72 Hours
98% Success Rate On Recoverable Data
14 Years Experience * 23 Operating Systems
800-728-3000 (Long Beach, CA)
800-466-0863 (Boston, MA)

DATA WAREHOUSING

UNLOCKING THE POWER OF INFORMATION
Solvers Inc. . . . . (800) 999-4829

DISASTER RECOVERY

CHI/COR Information Management, Inc.
(312) 322-0150
Recovery Planning Made Easy. PC software tools guide network, data center, and business unit planning. Includes complete methodology to teach novices recovery planning concepts and relational database for easy planning. MS-Windows and LAN compatible

CHI/COR Information Management, Inc.
Recovery Planning Software . . . (800) 448-8777

EDUCATION & TRAINING

James Martin World Seminar
(312) 346-7000
Business Process Redesign and Enterprise Engineering in computer industry's most valuable seminar. Three days with Dr. James Martin that will change your professional life. Also, Software Reuse Engineering and Client/Server tutorials. Call for seminar dates and prices.

NIIT - Training Division . . . . . (404) 804-6446
Developers of custom Computer Based Training (CBT), Multimedia, and Performance Support Systems. Development site is ISO-9001 certified. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax (404) 804-6445.

VISUAL BASIC Training
Texas Software Svcs. . . . . (214) 404-1055

EASY TECHNICAL UPDATING
50-Minute videos, $29.95 each, on today's crucial topics (client/server, OOPS, software engineering, networking, AI) by over 40 leaders (Stroustrup, Bell, Knuth, Microsoft, etc.) CONTACT UVC, toll-free 1-800-900-1510 x1112, uvc.lemon@forsythe.stanford.edu. FREE CATALOG. SATISFACTION GUARANTEED

ELECT. DATA INTERCHANGE

EDI software, consulting, & integration
Next EDition, Inc., 14+ yrs exp (215) 498-0602

FAX-ON-DEMAND

COMPUTER-FAX INTEGRATION
Discover the Power of Fax-On-Demand. Increase Sales. Save 90% over past method. Delivery product literature upon request 24 hrs/day, 7 days/wk. Buy Fax-On-Demand Marketing Tool for the 90's to learn how. For more, call 408-243-2275, get Doc #210
AllConsultants 1-(800) 982-3716

GROUPWARE LOTUS NOTES

Nationwide Professional Services
Summit Software Services, Inc. (503) 226-6250

I/T CONSULTING

ITM, Inc. (617) 489-3639
Focus: *Development Productivity, Data Management, Strategic Planning, Staff Augmentation*; Custom, business aligned methodologies (w/integ Bus. Proc. Re-Eng. & Data Mgmt), Impl. Coaching, Meth Educ., CASE, GUI PowerBuilder (Dev & Proj Mgrs), Info Modelers, etc. Data Warehousing & Admin., I/T Planning, Arch. Des. ***We help you use I/T to create Business Value through Organizational Success.***

MCBA

SYSTEMS DESIGN & SERVICES, INC. - (708) 894-1674 Specializing in support, enhancements, upgrades, conversions. Established 1982. ALL applications, releases, versions, languages, operating systems. NEW! UNIX/AIX, AS/400 SOFTWARE FOR: ACCOUNTING, DISTRIBUTION, MANUFACTURING, HUMAN RESOURCES, 4GL

MEMORY

MEMORY CONVERSIONS DIP/SIP 30/72 SIMM
Autotime Corp. (503) 452-8577

OBJECT CLASS LIBRARY

MetaSolv Software, Inc.
(Powersoft CODE Partner) (214) 239-0623 x104

OFFSHORE SOFTWARE DEV.

COSTA RICA - "A BETTER WAY"
Low-cost, hi-quality offshore programming. Central Time Zone, 3 hour flight from USA. Satellite Links. Oracle, Visual Basic, Powerbuilder, Sybase, C++, COBOL, AS400.
Nestair, Houston . . . . . (800) 448-7277

Hexaware Technologies -
A Blue Chip Resume:
- *Client/Server* technology focus
  - **Oracle, Sybase**
  - **Powerbuilder, Uniface, Visual Basic**
- Complete Turnkey responsibility
- Virtual 64 kbps data link from your office to India
- State-of-the-art software development center in India.

Hexaware Technologies -
A Blue Chip Resume:
- Large pool of quality software talent
- International quality standards
- Success stories in US/Middle East/India
- Joint Venture option

Tel: (908) 561-5195; Fax (908) 561-0638;
Partner for Success
Hexaware Technologies, Inc.
Princeton • Bombay • Bahrain • Dammam

OFF-SITE SOFTWARE DEV.

AS-400/CICS/UNIX/Client-Server applications
AMPERSAND CORP. . . . . (516) 548-0100

Powerbuilder/ORACLE/SYBASE/etc. - C/S Applications PowerSource, Inc. . . . . (908) 229-2554

OUTSOURCING

ALICOMP and CBS Data Services formed a business alliance to offer the highest level of technical, operational, and managerial expertise within a single mandate: loyalty and the highest quality computer services with flexible pricing.
ALICOMP/CBS
(800) 274-5556
(See Our Ad in the MarketPlace)

IBM MVS/ESA TIMESHARING
CICS DB2 IMS
Current IBM software releases. Specializing in outsourcing for software developers.
BOOLE & BABBAGE
COMPUTER SERVICES
(800) 22-BOOLE

OUTSOURCING/REMOTE COMPUTING
For 26 years we have nationally located outsourcing services on all platforms from over 2,000 data centers. ***NEVER*** a fee to our buyers because we are paid by our sellers. Call us today and join over 1,500 satisfied customers!
COMPUTER RESERVES, INC.
(800) 882-0000

FINANCIAL TECHNOLOGIES
COMPUTER SERVICES DIVISION
(703) 631-4401
OUTSOURCING - REMOTE PROCESSING
Multiple IBM ES9000 Mainframes
MVS/ESA VM/ESA
Current Software Releases.
7 days/week, 24 hours/day
Quality Service - Competitive Pricing

MCRB Service Bureau, Inc.
3090 Computer Services . . . . . (800) 941-MCRB

PC SOLUTIONS

Micro Focus COBOL, Dialog System, Panels2 solutions. Next EDition, Inc. . . . . (215) 498-0602

PURCHASING SOFTWARE

Commerce Software, Inc. (PurchaseSOL®)
Elmsford, NY . . . . . (800) 447-7172

REMOTE COMPUTING

ALICOMP, Inc. . . . . (800) 274-5556
(See Our Ad in the MarketPlace)

RIGHTSIZING

MCRB Service Bureau, Inc.
3090 Computer Services . . . . . (800) 941-MCRB

SECURITY

Security Audits, Training and Consulting
NCSA is the leading source of computer security educational materials. We also conduct security audits, training and can help you develop security policies and procedures. Request our free 32 page security resource catalog.
National Computer Security Association
(717) 258-1816 Fax (717) 243-8642
75300.2557@compuserve.com
CompuServe: GO NCSAFORUM

VANGUARD Integrity Professionals
Security/Audit MVS Software (714) 939-0377

SOFTWARE REUSE

RPM ®
Reuse Process Manager ®
"a windows and C/S based process manager with a customizable environment for defining, measuring and practicing reuse-driven software development"
developed by Dr. Carma McClure
Extended Intelligence, Inc.
(312) 346-5245 x360

TELESERVICES

IBM Rochester TeleServices
Rochester MN . . . . . (800) 365-4426 ext. 500

SOLUTIONS DIRECTORY

Have Solutions To Sell?
For Less Than $35 per Issue, You Can Sell Them HERE!

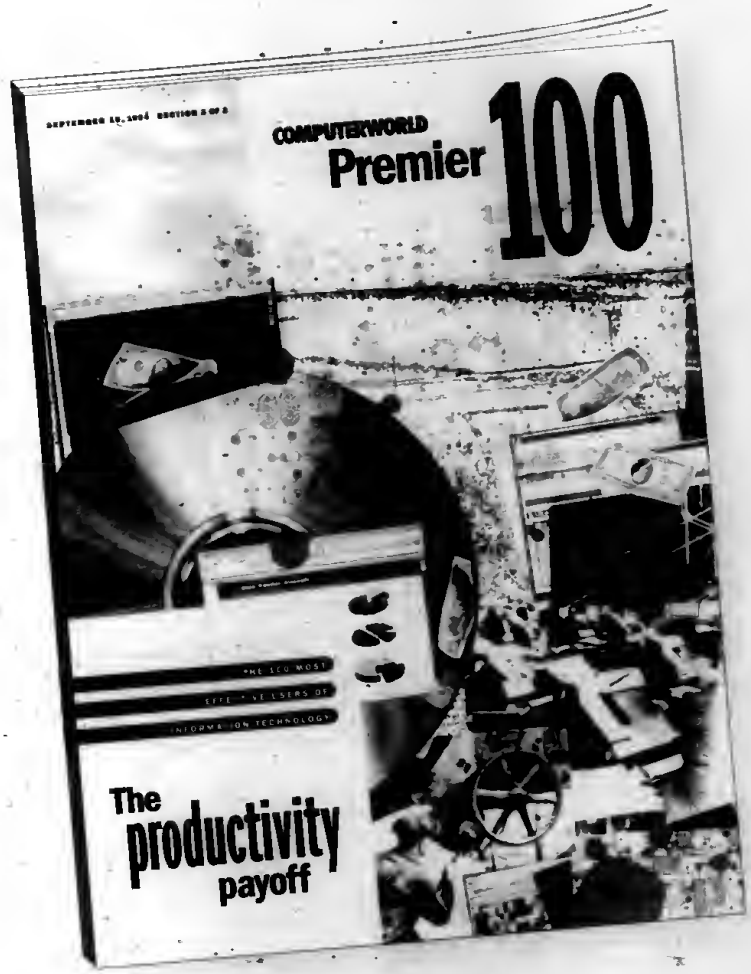
In the Computerworld Marketplace Solutions Directory. You simply choose the type of listing you want, and we'll run it for 26 consecutive weeks - under the category of your choice!

Plus, you can run your listing under an additional category at a 50% discount rate. To start your Solutions Directory Listing in September, your order must be received by September 23.

Listing Type	*6-Month Cost*	*Description*
Basic	$899	2-line listing in plain typeface
Bold	$996	2-line listing in boldface type
Boxed	$1499	30-word company listing enclosed in box

Please Fax Your Listing/Category to: Nancy Whittaker 1-508-620-7739 **Or Call:** 1-800-343-6474 x744

Find Out Who's the Best in IS.



Announcing the 7th Annual Computerworld Premier 100

Ranking the top 100 companies across U.S. business industries, the *Computerworld Premier 100* magazine measures IS effectiveness based on profitability, technology utilization, IS budget direction and management methods. Use this exclusive information to benchmark your success in IS for 1994.

The Computerworld Premier 100
The 100 most effective users of information systems

Sponsored by:

SUN

Advertisers' Index

ADA Software	24
AT&T	18-19, G1-G3
BMC	60
Borland	C4
Chipcom	C3
Compaq Computer Corp.	50-51, 58-59, 98
Computer Associates	3
Computron	40
CW Custom Publications	77
CW Premier 100	122
CW Circulation	41
CW Classified	65, 77
Dell	42
Digital Equipment Corp.	30-31
Gupta	85, 87
Hayes	9
Hewlett-Packard	13, 38-39, 82, 94-95
IBM	26-27, 48, 63-66, 124
Information Builders	17
Informix	57
Innovation Data Processing	7
Intel	22-23
Intergraph	66
Intersolv	62
LBMS	70
Lexmark	80
Lotus Development Corp.	25, 71-76, 121
Micro Focus	11
NEC Electronics	34-35
Novell	52, 53, 93
Oracle Corp.	5, 46-47
ParcPlace	29
Peoplesoft	40
Racal Datacom	20
Rasna	10
SAS Institute	54-55
SDP Technologies	81
Sequoia Systems	126
Synoptics	33
3M	89
Toshiba	21
Universal Data Systems	15
Wellfleet	60
Workstation Group	80
World Expo	119
Xerox	60

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Marketplace Advertisers' Index
Pages 110-118

[illegible], Inc.	[illegible]
Alpine Computer [illegible]	[illegible]
[illegible]	[illegible]
Apex PC [illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
Computer [illegible]	[illegible]-1140
CSC [illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible] Computer	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible] Computer, Inc.	[illegible]
[illegible]	[illegible]
[illegible] Technology, Inc.	[illegible]
[illegible] Computers, Inc.	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

Publisher
Kevin McPherson

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-875-4394

Bill Laberis
Vice-President Editorial

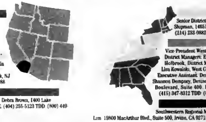
David Peterson
Vice-President Sales/Associate Publisher

Gail Odeneal
Vice-President Consumer Marketing

PUBLISHER'S OFFICE: *Assistant to the Publisher*, Lois Bennas **SALES:** *Display Advertising Production Manager*, Paula Wright, *Display Advertising Coordinators*, Peggy Hennessy, Lisa Tanner **SALES CLASSIFIED:** *Vice-President Recruitment Advertising*, John Corrigan, *Recruitment Marketing Director*, Derek E. Hultzky, *Classified Operations Director*, Cynthia Delany **MARKETING:** *Director, Marketing Communications*, Mary Doyle, *Account Manager, Marketing Communications*, Elizabeth Phillips, *Manager, Trade Show & Conventions*, Audrey Shohan, *Marketing Communications Project Manager*, Susan Thaxter, *Administrative Assistant*, Patty White **CIRCULATION:** *Vice President Circulation*, Gail Odeneal, *Director of Circulation Management*, Maureen Burke **PRODUCTION:** *Production Director*, Christopher P. Cuoco, *Production Manager*, Beverly Wolff **DISTRIBUTION:** *Distribution Manager*, Bob Wescott, *Traffic Manager*, Pat Walker

Sales Offices

Associate Publisher/Vice-President/Sales
David Peterson
Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171 Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-879-0446



Senior District Managers: Bill Cadigan, Sherry Driscoll, John Watts, Sales Assistants: Alice Longley, Lisa Bela, Tammy Grynowicz, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2915 TDD: (800) 428-8244

Mid-Atlantic

Senior District Manager: Fred LoSapio, District Managers: Paula D'Amico, Rich Molden, Sales Assistants: Susan Kusnic, Jean Dellarobba, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786 TDD: (800) 208-0288

Senior District Manager: Bernie Hockswender, Sales Assistant: Debra Brown, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758 FAX: (404) 255-5123 TDD: (800) 449-4974

Midwest

District Manager: Sharon R. O'Brien, Sales Assistant: Denice Richards, 980 N. Michigan Avenue, Suite 1400, Chicago, IL 60611 (312) 214-3606 FAX: (312) 214-4962

Southwest

Senior District Manager: Darren Ford, Sales Assistant: Brenda Shipman, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882 FAX: (214) 385-1603 TDD: (800) 822-4918

Western Offices

Vice-President Western Advertising Sales: Richard Espinoza, Senior District Managers: Ernie Chamberlain, Kaye Sharbrough, Linda Holbrook, District Managers: Christine Curry, Elizabeth Cooper, Lisa Kowalski, West Coast Operations Manager: Leticia Lehane, Executive Assistant: Denise Hui, Sales Assistants: Emily Gaytan, Shannon Dempsey, Denise Garcia, Andrea Zurek, Jim Schott, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312 TDD: (800) 900-3179

Southwestern Regional Manager: Fran Cowen, Sales Assistant: Aileen Lim, 19800 MacArthur Blvd., Suite 500, Irvine, CA 92715 (714) 757-4123 FAX: (714) 757-4124

Custom Publications

Boston: Vice President, Larry Craven, Director of Publishing Services/Carolyn Novack, Sales Assistant/Heidi Schuberthan, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 879-0446
San Francisco: West Coast Director/Elaine R. Offenbach, Sales Assistant/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

[illegible]

Sherry Driscoll, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2915, Kaye Sharbrough, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Marketplace Advertising

Sales Manager/Connie Martin Kearns, **New England** Account Executive/Susan Cardinal, **Mid-Atlantic** Account Executive/Michelle Brewer, **South-Atlantic/Midwest** Account Executive/Kevin Gasper, **Northwest** Account Executive/Andrew Sandbrook, **Southwest** Account Executive/Claude Garbarino, Solutions Directory/Nancy Whittaker, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474 FAX: (508) 820-0041

Recruitment Advertising Sales Offices

Vice President/Recruitment Advertising/John Corrigan, Marketing Director/Derek E. Hultzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474
New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, Account Executive/Karen Leslie, (800) 343-6474
Mid-Atlantic: Regional Manager/Marty Finn, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090, Account Executive/Caryn Dlott (800) 343-6474 TDD: (800) 208-0288
South-Atlantic: Regional Manager/Katie Kress, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474
Midwest: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 360, Des Plaines, IL 60018 (708) 827-4433, Sr. Account Executive/Ellen Crotts (800) 343-6474 TDD: (800) 227-9437
West: Regional Manager/Barbara Murphy, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0164, Sr. Account Executive/Christopher Glenn (800) 343-6474 TDD: (800) 203-5867
Computer Careers Online: Jay Savell, Account Executive, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

Direct Response Cards

Sales Manager/Connie Martin Kearns, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474
East: Account Manager/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090
West: Account Manager/Jill Greer, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0164

IDG International Marketing Services

President/Frank Cutitta, Eastern Advertising Manager/Veronique Lamarque, 187 Oaks Road, Framingham, MA 01701 (508) 879-0700 TDD: (800) 233-0537
Western Advertising Manager/Ginny Pohlman, 100 Harbor Drive, Suite 215, Sausalito, CA 94965 (415) 331-7571 FAX: (415) 331-0881

International Data Group

Patrick J. McGovern, **Board Chairman;** Walter Boyd, **President;** William P. Murphy, **Vice President Finance**

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over [illegible] computer publications in [illegible] countries. [illegible] million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina, Infoworld Argentina; AUSTRALIA'S Computerworld Australia, Australian PC World, Australian Macworld, [illegible] BULGARIA'S Computerworld Bulgaria, [illegible]; CANADA'S CIO Canada, Computerworld Canada, [illegible] Computerworld, InfoCanada, Network World Canada; [illegible] ... [illegible] VIETNAM'S PC World Vietnam

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:
COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.
Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

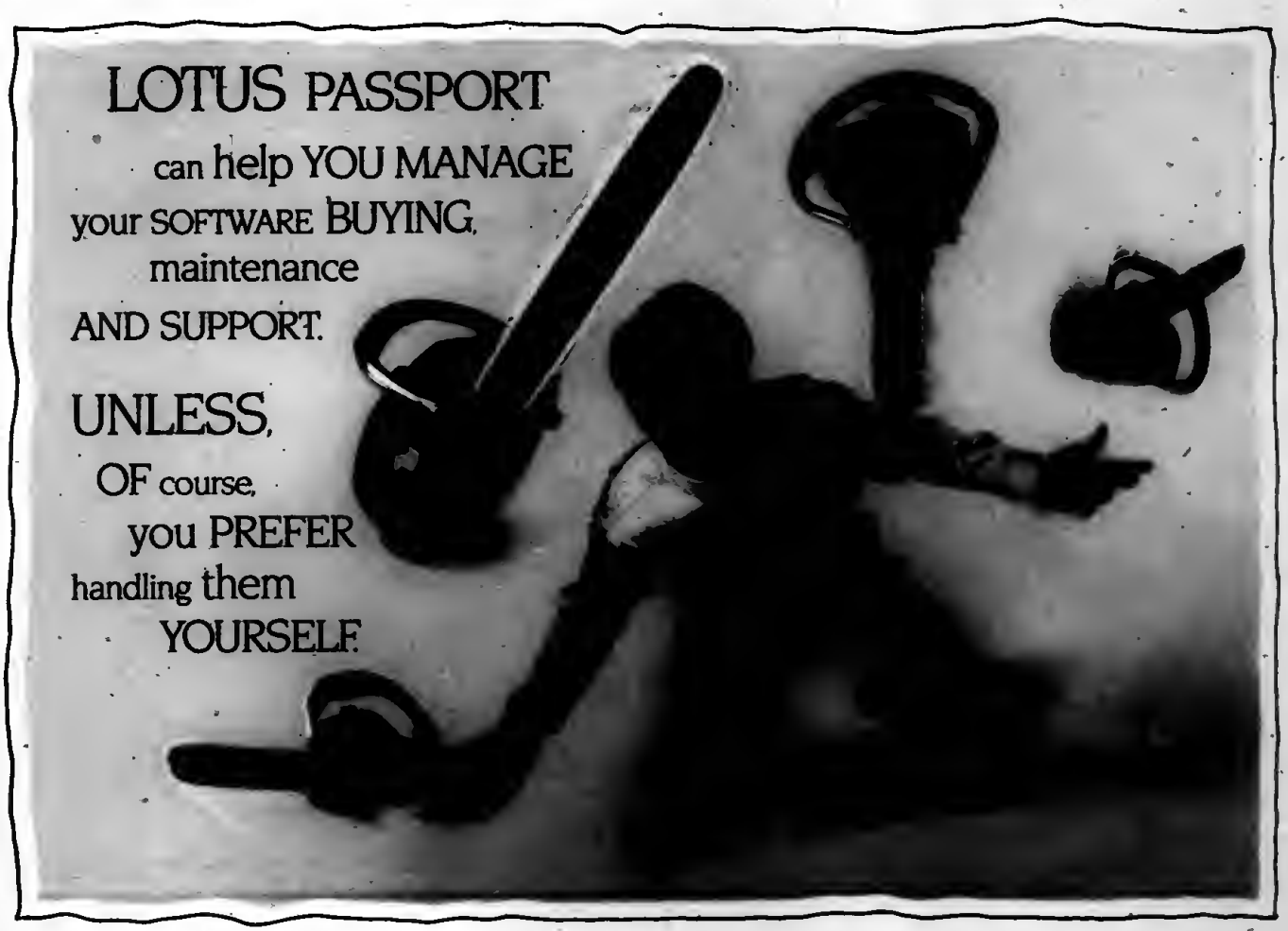
Address Changes or Other Changes to Your Subscription
All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here Address shown: ☐ Home ☐ Business

Name
Company
Address
City State Zip

Name	
Title	**Company**
Address	
City	**State** **Zip**

Other Questions and Problems
It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: **1-800-669-1002**
(Outside U.S. call (614) 382-3322)
CompuServe members can reach us at account number 73373, 1220



Installing, maintaining, and updating software to meet the changing needs of your business can be tricky. What you need is a software purchase, maintenance and support program flexible enough to help you manage it all. Enter Lotus Passport.™

Passport helps you manage your software assets, plan migration paths and reap the rewards of using Lotus software to improve productivity and increase profits. It will keep you covered at every stage of software ownership from initial purchase through maintenance and support.

Whether your organization is a small company, a decentralized department or a member of the Fortune 500, we can help you optimize your organization's technology investment. If you have 50 or more PC's, there's a Lotus Passport option that simplifies the way you manage software and services.

Make the most of your business while getting the most out of ours. Call 1-800-872-3387, ext. A178 for more information about Lotus Passport.*

Lotus
Working Together®

*In Canada, call 1-800-GO-LOTUS. ©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142
All rights reserved. Lotus Working Together is a registered trademark and Lotus Passport is a trademark of Lotus Development Corporation.

Business as Usual for the Enterprise Network Manager.

If you're involved in designing, building or managing the enterprise network, ComNet™ can help take the heat off. At ComNet, you'll hear from the experts, see the latest products from hundreds of vendors, and learn what new technology is on the horizon — all of which can help you assess complex and confosing new choices and accomplish more while keeping fires to a minimum.

Find Out What's Hot...and What's Not.

Explore the leading-edge technologies and emerging business applications that are the building blocks of the global enterprise network from ATM, Frame Relay and FDDI, to multi-media, videoconferencing, wireless, digital convergence and the Internet. Learn from the experts and users who will show you how to successfully integrate new technologies so you can avoid the crash and burn of outmoted strategies.

Thought Provoking Keynotes and the ComNet "Hot Seat."

Hear from industry movers and shakers Ellen Hancock, IBM Senior Vice President and Group Executive, who will share her vision of the future with you, and Reed Hundt, FCC Chairman and strong proponent of competition on the Information Superhighway. Then hear the experts debate "The NII — Freeway or Fee-way?" at the first-ever ComNet "Hot Seat" Plenary sponsored by Sun Microsystems.

ComNet Sizzles with the Latest New Products!

ComNet '95 is your chance to hear about the latest industry alliances and see new products on the day they're announced! In fact, more new products are introduced each year at ComNet than any other networking event in the world. The industry's leaders and emerging companies will be at ComNet '95 — so should you.

LiveNet® and Wireless Pavilions Address Burning Network Issues.

Visit LiveNet and see how legacy architectures and advanced network technologies can be successfully integrated into a high-speed, high-performance global enterprise network. LiveNet links each department of a model corporation and demonstrates real integrated applications. And don't miss the Wireless Pavilion, where you'll find the products that give substance to the promise of "anytime, anywhere" computing.

Take the Heat Off! Call Today for More Information.

Call 800/225-4698 today to receive a conference brochure. Or fill in and fax the coupon below to 508/872-8237.

COMNET '95

CONFERENCE & EXPOSITION

Leading Communications into the Global Age

January 23-26, 1995
Washington Convention Center
Washington, D.C.

☐ **YES! I want to *ATTEND* ComNet. Send me more information.** CW2
☐ **YES! I want to *EXHIBIT* at ComNet. Send me more information.**

NAME _____ TITLE _____
COMPANY _____
STREET ADDRESS _____ MAIL STOP _____
CITY _____ STATE _____ ZIP _____
PHONE _____ FAX _____

For fastest service Fax to 508/872-8237 Or Mail to ComNet '95, 111 Speen Street, Framingham, MA 01701-9107.

ComNet '95 is owned and managed by IDG World Expo

Companies in this issue

Page number refers to page on which story begins

3Com Corp. 12
3M Co. Cover1

A

Aberdeen Group Cover1,12
Advanced Manufacturing Research, Inc. 79
Advanced Micro Devices, Inc. 46,105
Advantis 43
Alex. Brown & Sons, Inc. Cover1
Alphatronix, Inc. 53
Alydaar Software Corp. 86
Amdahl Corp 8
Amerada Hess 80
America Online, Inc. 8
AmeriData Consulting, Inc. 32
Amerisure & Cos. 15
Ameritech Corp. 8
AMR Corp. 105
Andersen Consulting 10
Annex Research 69
Apertus Technologies, Inc 49
Apex Data, Inc. 47
Apollo Computer, Inc. Cover1
Apollo Group, Inc. Cover1
Apple Computer, Inc. 14,47,70,83
Applix, Inc. 49
Ardis Co. 8,99
Arthur Andersen & Co. 86
ASAP Software Express, Inc. Cover1
AT&T Corp. 8,12,14,79
AT&T Global Information Solutions Cover1,69
AT&T Network Systems 49
AT&T Paradyne 20
Atex Publishing Systems 70
Avon Products, Inc. 8
Axil Computer, Inc. 56

B

Baan USA, Inc. 79
Baber Information Services, Inc. 70
Banc One Corp. Cover1
Bank of Montreal 10
Bankers Trust Co. Cover1,4
Berkeley Design Technology, Inc. 20
BIS Strategic Decisions 28,46,49
Blue Cross/Blue Shield Association 4
Blythe Software, Inc. 80
Boeing Commercial Airline Group 79
Brewers Retail, Inc. 49
Bruce McGraw Graphics 83
Burger King, Inc. 49
Business Research Group 99
Business Systems Group 14
Butler Service Group 110

C

C-T Link, Inc. 44
Cabletron Systems, Inc. 70
Cascade Computer Technologies 2
CDS Tech Knowledge Ease 2
CenterLine Software, Inc. 80
Chevron Information Technology Co. Cover1
Cheyenne Software, Inc. 53
Chicago Mercantile Exchange 49
ChipSoft, Inc. 32
CIMI Corp. 67
Cisco Systems, Inc. 12,62
Citibank NA 24
Citicorp Dealing Resources, Inc 110
Columbia Artists Management, Inc. 83
Communications Network Architects, Inc. 15
Compaq Computer Corp. 6,28,49,105
CompuFlex International, Inc. Cover1
CompuServe, Inc. 62
Computer Associates International, Inc. Cover1
Computer Based Solutions, Inc. Cover1
Computer Intelligence/InfoCorp Cover1, 32,49
ConnectSoft 8
Conner Peripherals, Inc. 53,61
Continental Cablevision 12
Coopers & Lybrand 10
Corestates Financial Corp. Cover1
Cray Computer Corp. 32
Cray Research, Inc. 32
Creative Interaction Technologies, Inc. 56
CSX Corp. 69
Currid and Co 99
Cygnet Systems, Inc. 77
Cylix Communications Corp. 110
Cyrix Corp. 46,52

D

D. H. Brown Associates, Inc. Cover1
Data General Corp. 61
DataBeam Corp. 8
DataComm Research Corp. 99
Dataquest, Inc. 43,79
Delrina Corp. 8
Dialogic Corp. 44
Digital Equipment Corp. Cover1,6,8,10,32, 62,70,77,80,83,110
Dimeric Development Corp. 32
Disk/Trend, Inc. 32
Dun & Bradstreet Software 43
DynCorp. 7

T

Eaton Corp. 20,46
Egghead Discount Software 8
Electronic Data Systems Corp. Cover1
Electronic Industries 32
EMC Corp. 32

F

Federal Express Corp. 24
First Bank System 67
First Fidelity Bancorp. Cover1
First Union Bank 15
First Virtual Corp. 61
Fish & Richardson 6
Forte Software, Inc. 8
Forward Concept 20
Freeman Associates 53

G

G2 Research, Inc. 10
Gartner Group, Inc. Cover1,8,69
Gemini Transportation, Inc. 43
General Accident Insurance of America 69
General DataComm, Inc. 62
Greystone Peripherals, Inc. 70
GT Global Cover1
GTE Telephone Operations Cover1
Gulf Canada Resources Ltd. 2,4

H

Hall and Swasick, Inc. 105
Heart Federal Savings and Loan Cover1
Help/Systems, Inc. 70
Hewlett-Packard Co. Cover1,6,20,44, 49,61,91
Hickory Farms, Inc. 83
Hughes Aircraft Co. 79
Hughes LAN Systems, Inc. 91
Hydro Quebec 43

I

IBM Cover1,4,6,8,14,15,20, 43,49,67,69,91,110
IBM Microelectronics 52
IBM PC Co. 6,7,28
ILOG, Inc. 80
Information Systems Management Corp. 67
Informix Software, Inc. 79
Insignia Solutions, Inc. 49
Integrated Systems Solutions Corp. 86
Intel Corp. Cover1,6,7,8,20,46,52,69
International Data Corp. Cover1,4,6, 14,79,80
Intersolv, Inc. 32
InterWorks, Inc. Cover1
Intuit, Inc. 32

J

JDM Service 70
Johnson & Johnson 83

A

Kaiser Foundation Health Plan 14
Kantek, Inc. 47
Key Services Corp. Cover1
KeyCorp. Cover1
Klynas Engineering 47
KPMG Peat Marwick 99

L

LAN-Aces, Inc. 56
LanOptics Ltd. 12
Layland Consulting 67
Legent Corp. 14
Liant Software Corp. 80
LightStream Corp. 12
Loctite Corp. 83
Logue & Rice, Inc. 8
Lotus Development Corp. Cover1,2,4, 24,43,61
Lutheran Brotherhood Insurance 7

M

Mallinkrodt Medical, Inc. 81
MCI Communications Corp. 8,24
MediaVision 47
Meta Group, Inc. 61
Micro Express 47
Micrografx, Inc. 49
Micropolis Corp. 32
Microsoft Corp. Cover1,2,4,6,8,12,14, 15,20,43,44,49,61,69,70
Motorola, Inc. 52

N

NASA Cover1,8,44
NCube 69
NEC Technologies, Inc. 7
Network Computing Devices Cover1
Network Express, Inc. 61
Newport Systems Solutions, Inc. 12,62
Nordstrom, Inc. 24
Northeast Consulting Resources, Inc. 14
Northrop Grumman Corp. 79
Norwest Corp. 127
Novell, Inc. Cover1,2,4,8,14,15,44,56, 61,62,70,79,127

O

Oracle Corp Cover1, 4,69,70,79,80

P

Palindrome Corp. 53
Panasonic Personal Computer Co. 7
Patricia Seybold Group 14,49
PeerLogic, Inc. 49
Pennsylvania State Credit Union 44
Philip Morris Co. 86
Phillips Cables Ltd. 43
PictureTel Corp. 8
Platinum Technology, Inc. 32
Powersoft Corp 91
Price Waterhouse 14
Princeton Softech, Inc. 70
Proteon, Inc. 62,67
Provident Life and Accident Insurance Co. 69
Publishers Printing Co. 14

Q

Quantitative Medicine, Inc. 77
Quark, Inc. 70

R

RAM Mobile Data 8,99
Rancho Technology, Inc. 47
Rational Software Corp. 80
Raxco, Inc. 70
Restaurant Services, Inc. 49
Roadnet Technologies, Inc. 86
Rockwell International Corp. 2
Rupp Technology Corp. 56

S

Sage Technologies, Inc. 32
Salomon Brothers, Inc. Cover1,32
SAP America, Inc. 79
SAS Institute, Inc. 69
Savings & Community Bankers of America 43
Scitex America Corp. 70
Scopus Technology 91
Sears, Roebuck and Co. 43
Security Dynamics, Inc. 67
Sedgwick, Inc. 2,4
Shared Medical Systems Corp. 77
SHL Systemhouse, Inc. 10
Simon and Schuster 86
Smart Modular Technologies 47
Society Corp. Cover1
SoftKey International, Inc. 32
Software 2000, Inc 8
Software AG of North America, Inc 70
Software Edge, Inc. 32
Software Marketing Corp. 32
Spectrum Computer Technologies Corp. 56
Spectrum Signal Processing, Inc. 20
Star Electronics 44
Stylus Innovations, Inc. 44
Summit Strategies, Inc. 6,49
Sun Microsystems, Inc. Cover1,10, 49,56,70
Sun Microsystems Computer Corp 8
Sybase, Inc. Cover1,10,12,61,79,91
SynOptics Communications, Inc. 91
Systems Integrators, Inc. 70
Systron, Inc. 44

T

Tandem Computers, Inc. 70
TEI Technology Enterprises, Inc. 2
Texas Instruments, Inc. 8,105
The Associated Press 8
The Burton Group Cover1
The Chase Manhattan Bank NA Cover1,12
The Santa Cruz Operation Cover1
The Tower Group Cover1
The Yankee Group 12,61,67
Thinking Machines Corp. 32
Timex Corp. 79
Tivoli 94
Toshiba America Information Systems, Inc. 7
Toshiba Corp. 47
Transamerica Commercial Finance Corp. 79
Trustmark Insurance Co. 40
Tupperware Corp. 10

U

U.S. Bank Cover1
UniSolutions Associates 70
Unisys Corp. Cover1
United Parcel Service, Inc. 99
US West 12

V

Vinca Corp 62
Voice Processing Corp. 44
VSI Enterprises, Inc. 86

W

Wal-Mart Stores, Inc. 8,12
Wandel & Goltermann 2
Wang Laboratories, Inc. 110
Western Data Corp 91
William Morris Agency 61
Wireless Computing Associates, Inc. 8
WordPerfect Cover1,14

X

X/Open Co. Cover1
XVT Software, Inc. 80

Z

Zenith Data Systems 49

"The IBM PS/2 Server 95 Array belongs on every system manager's short list."

Julian Evans
PC Magazine
UK Edition
December '93

The IBM Server 95 with RAID-5

Full RAID-5 protection at RAID-0 performance levels—an impressive combination. This is a primary reason Mr. Evans urges "short listing" the IBM PS/2® Server 95 Array. An urging, we might add, that is based on extensive tests and expert comparisons against the competition.

What paying heed to Mr. Evans means is the opportunity to choose IBM reliability in a full-performance, fault-tolerant server package. *"A natural choice,"* as PC Magazine puts it, *"for hosting mission-critical networked database applications."* And indeed, their server choice for Editors' Choice.

In choosing the IBM PS/2 Server 95 for your application, more IBM benefits are at your service. Not the least of which includes a 30-day, money-back, quibble-free guarantee, a 3-year, same day, on-site warranty* and around-the-clock, 7-days-a-week IBM service and support. Anywhere in the USA.

For more information, call our 24-hour Personal Systems HelpCenter® at 1-800-772-2227** or to receive a FAX, dial 1-800-IBM-4FAX and ask for documents 2375 and 2376.

PC MAGAZINE UK EDITORS' CHOICE™

IBM PS/2 Server 95 Array
December '93

Pick your power—
Intel® Pentium™ 66MHz and 60MHz,
Intel 486DX2 66MHz processors

■

Migration made easy—
protect your investment with
total processor upgradability

■

Break bottlenecks—with zero-wait SyncroStream®
data-piping technology

■

Super speed—a 256KB cache
SCSI-2 Fast/Wide disk controllers

■

C2 security—IBM LogicLock™ locks in data, locks
out unauthorized entry

*Copies of IBM's statement of limited warranty are available upon request by calling 800-772-2227.
**In Canada, call 800-465-7999. IBM and PS/2 are registered trademarks and SyncroStream is a trademark of the International Business Machines Corporation. Intel is a registered trademark and Pentium is a trademark of the Intel Corporation. PC Magazine UK is a trademark of Ziff-Davis Communications. ©1994 IBM Corporation.

IBM

Gainers Losers

Percent

Gainers		Losers	
MathSoft	50.0	Struct. Dynamics Research	-39.5
CompUSA Inc.	36.1	Cray Computer	-19.2
Data Race Inc.	29.7	Walker Interactive Systems	-18.8
Merisel	21.4	State of the Art	-11.1
Symantec Corp.	21.2	Hogan Systems Inc.	-10.2
NetManage Inc.	19.6	IPL Systems Inc.	-9.7
Microage Inc.	19.2	System Software Assoc.	-8.6
Intelligent Info. Systems	18.8	Cambex Corp.	-8.3

Dollar

Gainers		Losers	
StrataCom Inc.	4.75	Struct. Dynamics Research	-3.06
Adobe Systems Inc.	4.63	Intuit Inc.	-2.88
Compuware Corp.	4.56	Wall Data Inc.	-2.75
Chipcom Corp.	4.50	Walker Interactive Systems	-1.63
General DataComm Inds.(H)	4.50	Octel Communications Corp.	-1.25
IMRS	4.50	System Software Assoc.	-1.25
Parametric Technology	4.19	Sybase Inc.	-1.12
Integrated Silicon Systems	3.88	Cirrus Logic	-1.00

Technology shares as a whole rose last week, while General DataComm reached a new high for the fifth week in a row. Intuit, Inc.'s shares dropped after it reported a quarterly loss.

[redacted]

If you stock it, will they come?

One sector of technology stocks that might gain from the burgeoning PC market [CW, Sept. 12] is the retail chains that have been struggling, in some cases, to sell the hardware and software products to consumers.

According to Clifford Haigler, an analyst at SouthCoast Capital Corp. in Austin, Texas, the primary issue facing the largest computer retailer, **CompUSA, Inc. (CPU)**, is that the price of Intel Corp. Pentium-based computers is too high and users do not want to buy I486s. "If the price comes down enough, you'll see more demand," he said. But right now, "investors are very skittish on CompUSA."

Additionally, while rivals Best Buy and Circuit City also sell audio and video electronics, CompUSA is strictly a computer retailer. "They are leveraged to the computer cycle more than anyone else," Haigler said.

Meanwhile, an optimistic Thomas Carley at Jensen Securities in Portland, Ore., rates once-troubled software seller **Egghead, Inc. (EGGS)** a Buy based on its retail success during the last three quarters, new management, a strong balance sheet and a new retail format. "The combination of the leverage generated by being one of the largest domestic resellers of software, cost-cutting efforts to improve profitability and a talented new executive team has enhanced Egghead's growth potential," he said.

Last month, two other software retailers, **Babbages, Inc. (BBGS)** and **Software Etc. Stores, Inc. (SFWR)** announced plans to merge. Even so, Keith Benjamin of Robertson, Stephens & Co. in San Francisco considers the shares attractive only for long-term investments. They have short-term risk because of the uncertainty in the 16-bit software market, he said.

— Tim Ouellette

Retail computer suppliers

CompUSA shares have increased steadily in the past weeks, while Egghead is poised for gains, trading 23% below book value

Company	Ticker	Sept. 2	Sept. 9	Sept. 16
Babbages	BBGS	[illegible]	[illegible]	12
CompUSA	CPU	8¾	9	12⅝
Egghead	EGGS	[illegible]	[illegible]	[illegible]
Elek-Tek	ELEK	9	9½	10
Software Etc	SFWR	[illegible]	9	[illegible]

Sept. 16 Stock Ticker

Exch	52-Week Range		Company	Sept. 16 Close	Wk Net Change	Wk Pct Change
			Communications and Network Services			UP [illegible]
OTC	36.38	13.50	3COM Corp	36.50	3.19	9.6
NYS	44.88	36.25	AMERITECH Corp	41.75	0.88	2.1
NYS	61.50	60.50	AT&T	55.00	1.00	1.9
OTC	26.50	12.75	Banyan Systems Inc.	16.75	0.19	1.1
NYS	69.13	49.00	Bell Atlantic Corp	23.75	1.00	1.9
NYS	63.88	53.00	BellSouth Corp	57.38	0.13	0.2
NYS	21.50	8.50	Bolt, Beranek & Newman	18.63	2.13	12.9
OTC	15.75	9.00	Brooktrout Technology	11.00	0.50	4.8
NYS	23.00	33.06	Cabletron Systems (S)	47.38	3.77	8.2
OTC	43.00	10.00	Centigram Communications	16.50	2.13	14.8
OTC	60.22	31.50	Chipcom Corp	57.50	4.50	8.5
OTC	40.75	18.75	Cisco Systems Inc.	26.00	0.69	2.7
OTC	18.50	0.25	Compression Labs Inc	10.50	-0.80	-7.7
OTC	12.50	5.13	Computer Network Tech.	2.25	0.58	2.3
OTC	33.72	8.50	CrossComm.	10.25	1.06	11.6
OTC	3.00	1.50	Data Switch Corp	2.38	-0.09	-2.6
OTC	36.50	12.88	DSC Communications	30.63	1.88	6.5
NYS	28.75	8.22	General DataComm Inds. (H)	28.75	4.50	18.6
NYS	39.88	29.50	GTE Corp.	30.50	-0.12	-0.4
NYS	95.92	78.63	ITT Corp	81.63	0.88	1.1
OTC	29.63	21.38	MCI Communications Corp.	24.38	0.75	3.2
OTC	8.25	2.38	Microcom Inc	7.88	0.44	5.9
OTC	27.50	11.25	NetManage Inc.	21.50	3.50	19.4
OTC	7.25	4.00	Netrix Corp	4.88	-0.22	-4.9
OTC	8.75	3.38	Network Computing Devices (L)	1.88	0.38	10.7
NYS	14.88	7.50	Network Equipment Tech. (H)	14.25	0.25	1.8
OTC	21.38	11.88	Network General	19.44	-0.50	1.9
OTC	9.63	6.50	Network Systems Corp.	8.63	0.00	0.0
OTC	72.25	26.50	Newbridge Networks Corp	21.88	0.00	0.0
NYS	36.88	23.25	Northern Telecom Ltd.	36.88	2.00	5.7
OTC	26.63	13.38	Novell Inc.	15.50	-0.50	3.1
NYS	48.50	33.22	Nynex Corp	37.75	0.38	1.0
OTC	30.00	15.50	Octel Communications Corp	22.00	1.25	5.4
OTC	18.75	9.00	Optical Data Systems Inc.	18.75	0.50	2.7
OTC	7.50	3.13	Penril Data Comm Networks	3.75	0.13	3.4
OTC	20.75	10.00	PictureTel Corp	17.50	1.38	8.2
OTC	8.25	2.13	Proteon Inc.	4.13	0.00	0.0
OTC	14.38	2.75	Racotek Inc.	4.13	-0.25	-5.7
NYS	45.00	24.88	Scientific Atlanta Inc.	44.25	0.50	1.1
NYS	42.25	36.75	Southwestern Bell Corp	41.50	0.38	0.9
NYS	40.22	31.50	Sprint Corp.	39.50	1.38	3.6
OTC	26.75	13.38	Standard Microsystems Corp	21.75	1.88	9.4
OTC	43.50	12.13	StrataCom Inc.	42.50	4.75	12.2
OTC	33.75	13.13	Synoptics Communications	15.75	-0.19	1.2
OTC	15.25	3.88	Telebit Corp	2.22	0.09	1.8
OTC	46.00	23.00	US Robotics	35.63	1.75	5.2
NYS	50.75	38.25	U S West Inc.	38.50	-0.25	-0.6
OTC	43.88	10.75	Wellfleet Communications	22.13	-0.50	-2.2
OTC	28.25	12.75	Xircom	19.50	-0.25	-1.3
OTC	23.75	13.25	Xylogics Inc	23.75	2.00	9.2
OTC	29.25	11.25	Xyplex Inc	22.25	0.13	0.2
			PCs and Workstations			UP [illegible]
OTC	7.50	2.43	Advanced Logic Research	4.13	-0.13	-2.9
OTC	38.50	22.00	Apple Computer Inc	36.00	1.13	3.1
OTC	33.00	12.00	AST Research Inc.	14.00	-0.06	-0.4
NYS	39.88	18.41	Compaq Computer Corp	37.62	1.75	4.9
OTC	37.50	15.13	Dell Computer Corp.	37.50	3.81	11.3
OTC	25.00	9.25	Gateway 2000 Inc.	17.13	1.81	11.8
NYS	93.63	64.38	Hewlett Packard Co.	91.00	1.50	1.7
NYS	26.88	10.75	Silicon Graphics	24.63	-0.13	-0.5
OTC	31.38	18.25	Sun Microsystems Inc.	28.13	1.38	5.1
NYS	50.75	30.25	Tandy Corp.	42.75	-0.25	-0.6
OTC	2.13	2.38	Zeos International Ltd.	3.00	0.13	4.3
			Large Systems			UP [illegible]
ASE	10.25	4.50	Amdahl Corp	9.75	0.00	0.0
NYS	8.25	4.25	Convex Computer (H)	8.25	0.75	10.0
OTC	4.50	0.50	Cray Computer	1.31	-0.31	-19.2
NYS	33.75	19.13	Cray Research Inc.	21.00	-0.25	-1.2
NYS	10.75	6.63	Data General Corp	9.88	0.88	9.7
NYS	39.13	19.25	Digital Equipment Corp.	24.88	0.75	3.1
OTC	6.50	2.50	Encore Computer Corp	4.00	0.00	0.0
NYS	52.25	40.50	Harris Corp	48.63	1.00	2.1
NYS	71.38	41.25	IBM	71.38	3.75	5.5
OTC	18.75	7.75	NetFrame	11.00	1.25	12.8
OTC	26.00	3.88	Parallan Computer	4.50	0.13	2.9
OTC	22.00	5.38	Pyramid Technology	8.88	1.38	18.3
OTC	20.00	11.12	Sequent Computer Sys.	17.50	-0.12	-0.7
OTC	6.84	2.25	Sequoia Systems Inc.	5.00	0.41	8.8
NYS	38.63	22.88	Stratus Computer Inc.	37.88	0.25	0.7
NYS	16.38	10.00	Tandem Computers Inc.	15.50	0.88	6.0
OTC	30.00	3.88	TriCord Systems	5.38	-0.13	-2.3
NYS	16.50	8.63	Unisys Corp	10.75	1.12	11.2
			Software			UP [illegible]
OTC	34.88	16.50	Adobe Systems Inc.	34.88	4.63	15.3
OTC	8.13	4.38	American Software Inc	4.88	0.75	5.4
OTC	15.75	8.75	ASK Computer Systems	13.03	0.01	0.2
OTC	66.00	37.00	Autodesk Inc.	61.75	0.50	0.8
OTC	2.88	1.75	Bachman Info. Systems	2.25	0.00	0.0
OTC	28.25	20.50	BGS Systems Inc.	24.12	-0.63	-2.5
OTC	71.00	40.50	BMC Software Inc.	45.50	1.88	4.3
OTC	30.75	22.50	Boole & Babbage	29.75	1.50	5.3
OTC	10.25	8.50	Borland Int'l Inc.	12.31	-0.19	-1.5
OTC	25.00	6.75	Brock Control Systems Inc.	20.00	-0.25	-2.4
OTC	4.63	2.38	CE Software	2.75	0.00	0.0
ASE	30.56	6.25	Cheyenne Software Inc	11.50	-0.50	-4.2
OTC	14.25	7.38	Cognos Inc	12.22	0.13	1.0
NYS	44.88	27.38	Computer Associates	42.25	1.88	4.8
NYS	5.50	2.13	Computervision Corp	2.63	0.13	5.0
OTC	40.25	21.00	Compuware Corp.	44.91	4.56	11.3
OTC	14.00	8.75	Comshare Inc.	12.50	0.00	0.0
OTC	25.00	14.88	Corel Corp	19.88	2.88	16.9
OTC	7.13	2.88	Easel Corp	4.44	0.56	14.5
OTC	29.25	13.88	FileNet Corp	23.00	-0.25	-1.1
OTC	22.00	3.00	4th Dimension	8.25	0.75	13.6
OTC	12.00	7.25	Frame Technology (H)	15.00	0.75	5.2
OTC	11.00	7.00	Group 1 Software	8.00	0.00	0.0
OTC	31.75	6.75	Gupta	50.88	0.00	0.0
OTC	12.00	5.88	Hogan Systems Inc.	6.63	-0.75	-10.2
OTC	36.25	27.00	IMRS	36.25	4.50	14.2
OTC	43.12	11.50	Information Resources	13.38	-0.25	-1.8
OTC	24.50	14.25	Informix Corp	23.25	1.12	5.1
OTC	11.25	8.75	Intergraph Corp.	9.44	0.19	2.0
OTC	8.25	2.50	Interleaf Inc.	4.25	0.58	8.8
OTC	15.50	2.50	Intersolv Inc.	13.00	0.00	0.0
OTC	50.00	27.00	Intuit Inc.	40.13	-2.88	-6.7
OTC	18.75	2.22	Knowledgeware Inc.	3.75	0.06	1.7
OTC	34.75	17.50	Legent Corp	26.25	0.75	3.2
OTC	86.50	29.75	Lotus Development	42.80	-0.25	-0.6
OTC	18.00	6.00	Magic Software Enterprises	10.50	0.38	3.8
OTC	18.50	6.00	Manugistics Group Inc	8.75	-0.50	-5.4
OTC	7.50	1.44	MathSoft	3.00	1.00	50.0
OTC	11.25	4.50	McAfee Associates	8.50	-0.50	-4.3
OTC	12.25	9.50	Mentor Graphics	10.50	0.50	5.1
OTC	37.50	11.50	Micro Focus	13.00	0.13	1.0
OTC	33.63	4.63	Micrografx Inc.	5.75	-0.13	-2.1
OTC	29.25	37.50	Microsoft Corp	57.06	0.06	0.1
OTC	44.50	26.19	Oracle Corp	44.13	1.25	2.9
OTC	44.75	21.50	Parametric Technology	50.75	4.19	15.8
OTC	24.50	13.50	ParcPlace Systems Inc	21.88	-0.56	2.6
OTC	48.25	26.08	PeopleSoft	47.63	-0.50	1.2
OTC	6.25	1.50	Phoenix Technologies	5.50	0.00	0.0
OTC	69.38	26.25	Powersoft	44.50	-0.75	-0.6
OTC	39.75	2.50	Platinum Software	6.50	0.00	0.0
OTC	18.63	7.75	Platinum Technology (H)	18.63	1.62	9.6
OTC	60.22	27.00	Progress Software Corp	33.63	1.50	4.2
OTC	4.13	1.94	Quarterdeck Office Sys.	2.50	0.00	0.0
OTC	26.75	9.50	Rainbow Technologies Inc.	37.50	-0.25	2.0
OTC	10.50	3.38	RasterOps	3.75	-0.13	-3.3
OTC	14.50	2.88	Ross Systems	3.63	-0.13	3.3
OTC	28.63	2.75	Sapiens Intl. Corp. N.V.	4.88	-0.13	-2.5
OTC	14.63	9.75	Softkey International Inc.	14.00	0.75	2.7
OTC	8.63	3.00	Software Publishing Corp	4.75	0.00	0.0
OTC	11.00	2.00	State of the Art	6.00	-0.75	11.1
NYS	35.63	11.88	Sterling Software Inc	31.50	0.25	0.8
OTC	19.88	4.69	Struct. Dynamics Research	6.69	3.06	39.5
OTC	27.00	27.38	Sybase Inc.	40.13	-1.13	-2.3
OTC	20.50	9.88	Symantec Corp.	15.75	2.75	21.2
OTC	52.75	32.00	Synopsys	47.25	3.75	8.6
OTC	18.00	11.75	System Software Assoc.	13.25	-1.25	-8.6
OTC	6.75	3.22	[illegible] Corp.	3.63	0.00	0.0
OTC	30.00	11.75	Viewlogic Systems	19.75	1.75	6.8
OTC	23.25	12.00	VMark Software Inc.	20.25	1.00	5.2
OTC	13.75	4.00	Walker Interactive Systems	7.00	-1.63	-18.8
OTC	60.00	29.50	Wall Data Inc.	31.75	-2.75	-8.0
			Semiconductors			UP [illegible]
NYS	31.75	16.75	Advanced Micro Devices	29.50	1.63	5.8
NYS	32.88	19.38	Analog Devices Inc.	31.75	0.88	2.8
OTC	30.50	10.94	Atmel Corp.	30.25	1.00	3.4
OTC	7.50	3.61	Chips and Technologies	4.50	0.38	9.1
OTC	44.63	24.88	Cirrus Logic	29.43	-1.00	-3.3
NYS	20.00	11.75	Cypress Semiconductor Corp	20.00	0.75	3.9
NYS	20.13	13.00	Dallas Semiconductor	17.25	-0.50	1.2
OTC	28.00	14.75	Integrated Silicon Systems	28.00	3.88	16.1
OTC	24.50	55.00	Intel Corp.	88.75	1.13	1.7
NYS	35.13	13.00	LSI Logic Corp	35.12	3.75	12.0
OTC	26.75	12.25	Lattice Semiconductor	19.50	0.13	0.6
NYS	44.88	15.14	Micron Technology	42.00	2.25	5.7
NYS	55.75	42.13	Motorola Inc.	56.22	3.75	3.3
NYS	25.00	14.38	National Semiconductor	16.50	-0.75	-4.3
OTC	14.25	8.75	Sierra Semiconductor (H)	12.50	-0.50	3.6
NYS	69.50	55.75	Texas Instruments	77.88	2.00	2.6
OTC	18.88	9.50	VLSI Technology	11.50	-0.75	-6.1
OTC	14.50	2.88	Weitek	3.13	-0.08	-2.0
ASE	20.38	4.41	Western Digital Corp.	16.00	1.25	8.1
OTC	39.75	29.00	Xilinx	50.00	1.25	2.6
OTC	40.75	26.50	Zilog Inc.	33.50	0.63	1.9
			Peripherals and Subsystems			UP [illegible]
OTC	30.50	14.50	American Power Conversion	19.25	1.25	6.8
OTC	26.25	10.75	Banctec Inc. (H)	26.22	0.25	1.0
OTC	7.75	3.25	Cambex Corp	6.12	-0.50	-8.3
ASE	2.38	1.88	Cognitronics Corp	2.50	0.00	0.0
NYS	20.50	9.00	Conner Peripherals	11.13	-0.38	0.3
OTC	24.00	9.38	Creative Technologies Inc.	28.72	-0.07	-0.2
OTC	14.00	3.50	Data Race Inc.	8.00	1.38	29.7
ASE	10.25	4.11	Dataram Corp	5.12	-0.50	-8.8
NYS	23.00	12.50	EMC Corp.	18.25	2.00	11.6
OTC	9.88	3.13	Emulex Corp (H)	8.50	0.13	1.2
OTC	21.00	11.75	Evans & Sutherland	12.50	-0.25	-2.0
OTC	22.50	8.75	Exabyte	18.50	-0.25	-1.3
OTC	28.50	2.63	Intelligent Info. Systems	4.75	0.75	18.8
OTC	4.50	2.00	Iomega Corp	3.44	0.31	10.0
OTC	9.75	3.00	IPL Systems Inc.	3.50	-0.38	-9.7
OTC	28.50	13.75	Komag Inc.	25.00	1.88	8.1
OTC	8.63	4.25	Maxtor Corp	5.13	0.75	5.1
OTC	8.75	4.88	Micropolis Corp	7.13	0.50	7.5
OTC	22.50	10.25	Pinnacle Micro Inc.	13.25	0.13	1.0
OTC	20.23	6.50	Printronix Inc.	18.75	1.75	10.3
NYS	11.75	4.88	QMS Inc.	8.88	0.00	0.0
OTC	30.25	9.38	Quantum Corp	14.38	0.63	4.0
OTC	10.00	3.63	Radius Inc.	10.00	0.00	0.0
NYS	17.75	6.75	Recognition International	6.88	-0.25	-3.2
OTC	6.88	3.63	Rexon Inc.	4.25	-0.25	-5.6
OTC	28.75	16.25	Seagate Technology	24.75	0.25	1.0
NYS	41.50	21.75	Storage Technology	36.88	0.13	0.4
NYS	27.00	21.38	Tektronix Inc. (H)	37.88	3.50	10.2
NYS	109.50	69.88	Xerox Corp	105.13	-0.88	-0.8
			Services			UP [illegible]
OTC	27.25	14.50	American Mgmt. Systems	25.50	1.63	6.8
NYS	4.25	2.50	Anacomp Inc.	2.88	0.00	0.0
OTC	23.50	14.50	Analysts Int'l	14.75	0.00	0.0
NYS	56.88	47.63	Auto Data Processing	56.13	2.50	4.4
OTC	18.25	11.50	Cambridge Tech Partners	13.63	-0.13	-0.8
NYS	27.50	17.00	Ceridian Corp	26.63	0.12	0.5
NYS	24.25	15.75	Comdisco Inc.	21.50	-0.25	-1.1
OTC	12.50	8.50	Computer Horizons	11.13	0.25	2.3
NYS	45.25	29.50	Computer Sciences	43.25	-0.88	-2.0
NYS	10.38	8.38	Computer Task Group	9.75	0.00	0.0
NYS	31.25	6.75	CompUSA Inc.	12.25	3.25	36.1
OTC	12.75	6.38	Control Data Systems Inc.	7.25	0.00	0.0
OTC	11.00	6.11	Egghead Discount Software	7.13	-0.11	-1.7
NYS	39.00	28.50	General Motors E (EDS)	38.00	1.13	3.1
OTC	21.00	7.25	Inacom Corp	9.00	-0.63	-6.5
OTC	28.00	13.83	Intelligent Electronics	17.75	2.12	13.6
OTC	22.50	7.00	Merisel	10.63	1.88	21.4
OTC	32.50	9.25	MicroAge Inc.	15.50	2.50	19.2
OTC	40.50	20.50	Paychex	32.75	-0.75	-2.2
NYS	33.88	22.75	Policy Management Sys.	35.88	1.50	3.9
NYS	28.71	18.61	Reynolds and Reynolds	25.63	-0.13	-0.5
OTC	28.50	17.00	SEI Corp	22.25	0.75	1.1
OTC	20.38	20.88	Shared Medical Systems	27.75	2.25	8.0
OTC	11.00	4.80	SHL Systemhouse	5.44	0.38	7.7
OTC	25.50	8.25	Software Spectrum Inc.	13.63	0.88	6.8
OTC	42.75	31.50	Sungard Data Systems	34.00	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

Copyright Nordby International, Inc., Louisville, CO
This information is based on sources believed to be reliable, and while extensive efforts are made to assure its accuracy, no guarantee can be made. Nordby International and Computerworld assume no liability for any inaccuracies. For information on Nordby International's Data-On-Demand services for any of the above companies call Nordby International at (800) 926-7404

Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385697. Computerworld (ISSN 0010-4841) is published weekly, except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1994 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $4.00 a copy; U.S. — $48 a year; Canada — $110 a year; Central & So. America — $150 (surface) a year; Europe — $295 a year; all other countries — $295 a year. Subscriptions call toll free (800) 669-1002. POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305

MAKE YOUR BUSINESS

UNSTOPPABLE

What would happen if your business was stopped dead by computer failure?

You'd run a big risk of losing customers and revenue.

That's why we suggest you consider the advantages of a total availability computer system from Sequoia.

ON-LINE. ALL THE TIME.

Our Unstoppable Technology™ ensures the constant availability of even your most complex on-line business applications.

Our on-line diagnostics find and correct any potential problems. And our Unstoppable Service™ stands by you 24 hours a day, seven days a week.

The result is that the information you need to serve your customers better is always available.

FAULT TOLERANCE IS JUST THE START.

Our open systems UNIX® solution will meet your needs for years to come. We also have symmetrical multiprocessing, and the only fault-tolerant multi-instance ORACLE® with parallel server.

We cost much less than you think. In fact, you can buy just what you need now, and then easily add more power as needed. Which makes us a smart buy for even small, fast-growing companies.

Total Availability Solutions™

Our uninterrupted computing capabilities, data integrity, and on-line expandability can make your business unstoppable.

Call Sequoia today at **1-800-562-0011**. Ask for our free white paper *12 Ways to Make Your Business Unstoppable*. And get ready to bust loose.

SEQUOIA

© 1994 Sequoia Systems, Inc., 400 Nickerson Road, Marlborough, MA 01752. Mosaic Web access at *http://www.sequoia.com*. Sequoia is a registered trademark and Unstoppable Technology, Unstoppable Service, and Total Availability Solutions are trademarks of Sequoia Systems, Inc. All other trademarks are owned by their respective companies.

Users await price relief

CONTINUED FROM COVER 1

sures is their new willingness to sign pure per-user contracts, which can give customers more leeway than traditional price structures based on hardware size and model.

The Vancouver Stock Exchange, for example, has been talking with Sybase and Oracle for over a year about a $10 million information systems overhaul planned for 1995. "Oracle wants to give us a 30% to 40% discount off list, [while] Sybase says it's prepared to get real aggressive, too," said Jim Kent, the exchange's manager of technology planning.

Among the immediate threats is CA's sharp slash in Ingres pricing two weeks ago, which promised discounts of 50% to 80% off previous prices. Plus, Microsoft has renewed threats to make its SQL Server database, which now lists for $995 to $19,995, less expensive than ever — an estimated $150 per user — when the SQL 95 upgrade ships next year.

Feature fusion

Further pushing the database makers is commoditization. Their core engines are looking more and more similar, said W. Leland Hill, director of information technology at GT Global, a San Francisco financial firm. All the major providers sport standard functions, such as two-phase commit, uniform SQL and LAN and WAN support.

"It used to be that you couldn't get all that stuff from every vendor, so your choice was often made for you, depending on the features you needed," Hill said. "Price was almost secondary."

But no longer. These issues have made price the deciding factor for many new database users, said Becky Henderson, senior database administrator at The Associated Group, a finance and insurance conglomerate in Indianapolis.

For example, Henderson could not persuade upper management to buy Sybase products until the vendor came back with an offer that was less than half of what Associated had budgeted for the project. "We ended up paying less than $100,000 for what we thought would amount to $250,000," she said, referring to a client/server experiment last year.

CA's moves in particular present an immediate challenge to Oracle and Sybase, said Peter Kastner, an analyst at Aberdeen Group in Boston. "This is the second salvo that CA has fired at the opening of a major software industry pricing war," he said, referring to CA's steep discounting of its CA-Unicenter systems management tools last month.

Wait and see

Other pundits said Oracle and Sybase are not apt to change list prices immediately. "They'll look at the impact [of CA's Ingres price cuts] and then react," said Karen Cone, an analyst at Gartner Group, Inc. in Stamford, Conn.

Oracle recently simplified its convoluted price structure by switching to per-user pricing, so the company probably will not come back at CA with an overt discounting volley, agreed Spencer Lyman, lead analyst at Apollo Group, Inc., which owns the University of Phoenix. But salespeople at Oracle are willing to deal, Lyman said. "A certain realism is beginning to set in that vendors can't charge all over the map because there are just more choices out there now."

On the Sybase side, other than a promise to bring out competitively priced low-end databases in the wake of splitting with Microsoft over SQL Server, the firm has yet to revise pricing significantly, observers noted. But some users have muscled Sybase into providing pure per-user pricing, even though the vendor has not officially changed its price structure from a combination of processor- and user-based tiers.

Oracle and Sybase officials could not be reached for comment.

However, some users will not be able to take advantage of a price war, noted Ann Seki, treasurer at the Northern California Oracle Users Group. "The people at large companies who have negotiated multiyear deals already have to hope that they did the best they could at the time," explained Seki, who works in IS at Chevron Information Technology Co.

Sybase shoots for more customized support. See page 79.

Bank law

CONTINUED FROM COVER 1

$15 million. The older reader/sorters, Fowler said, are incapable of handling foreign deposits.

Analysts said they expect the federal law will generate a flurry of information systems-related activity. Some experts estimated that eliminating duplicate systems, staff and other operations will save multistate banks more than $2 billion over five years — money that could be used for better service and more lending.

Yet most of the major players have already standardized their branch banking platforms across state lines in an effort to reduce costs and achieve economies of scale, analysts and IS executives agreed.

"We operate the bank as a single bank as much as we can, so don't expect any big surprises," said Tim Meier, manager of information services at U.S. Bank in Portland, Ore.

For example, U.S. Bank, which has $21 billion in assets and 420 branches across five states in the Pacific Northwest, last month completed a yearlong effort to standardize its Portland, Seattle and Sacramento, Calif., operating centers. The centers all use IBM's ImagePlus Check Processing Control Systems, which run on a single IBM ES/9000 Model 962 mainframe. The bank's Sacramento facility had been using Unisys Corp.'s Item Processing System, which U.S. Bank obtained through an earlier acquisition of Heart Federal Savings and Loan.

Catch up to the times

However, the new federal legislation also repeals a Depression-era law that required bank holding companies to set up costly and inefficient subsidiaries — and duplicate information systems — in each state where they operate. This portion of the legislation is expected to have a more sizable impact on banks with offices within a few miles of one another that are separated by state boundaries.

For example, customers of Banc One Corp. today are unable to make deposits at the bank's branch in Covington, Ky., to accounts located across the Ohio River in Cincinnati. The new law topples such barriers, enabling banks to provide common services to all customers regardless of location.

Tim Meier: *U.S. Bank standardized centers in three cities*

Banc One, which has acquired 48 banks since 1988, is developing common banking systems for its 1,400 branches and 88 affiliates through a joint effort with Electronic Data Systems Corp. That project, which a Banc One spokesman described as 75% complete, should be finished by mid-1995.

The regional approach

Banc One is not alone in its branch standardization. "We're in the process of integrating all of our regional banks into one," said Craig Goldman, senior vice president and chief information officer at The Chase Manhattan Bank NA in New York. Interstate banking, Goldman said, will "help us to operate with less overhead and combine our various franchises into the New York flagship."

Next year, Chase expects to complete a five-year transition during which it will have consolidated 100 worldwide data centers into six. To date, the consolidations have saved Chase $30 million annually in real estate, staffing and operational expenses.

Corestates Financial Corp. in Philadelphia and First Fidelity Bancorp in Lawrenceville, N.J., are examples of two banks that strategically positioned themselves well in advance of the interstate banking law, said Bill Bradway, an analyst at The Tower Group, a Wellesley, Mass., financial services and technology consultancy.

Corestates and First Fidelity had been forced to maintain physically discrete customer account systems at affiliate locations in New Jersey and Pennsylvania. But both organizations took advantage of a loophole in state regulations that permitted them to consolidate systems across the border as long as the branches were within 30 miles of one another.

Skills gap

Interstate banking will also put a premium on wide-area networking skills — an area where the banking sector has less experience than other industries because of the old prohibitions on cross-border banking, according to M. Arthur Gillis, president of bank consultancy Computer-Based Solutions, Inc. in New Orleans.

KeyCorp, which manages 1,300 offices across 23 states, will likely extend its IBM SNA backbone network to accommodate additional cross-border applications and services, said Robert L. Tucker, executive vice president and manager of information services at Key Services Corp., the bank's services subsidiary in Albany, N.Y.

KeyCorp has integrated 80% of the systems from its March merger with Cleveland-based Society Corp. However, it is delaying any wholesale WAN backbone upgrades until the costs of high-speed networks such as frame relay and Asynchronous Transfer Mode have stabilized and the technologies have matured, Tucker added.

Across state lines

"As we talk of competing on the information superhighway, we cannot do it with financial institutions built like Ford's Model T," said one legislator voting to modernize the nation's banking laws last week.

Hyperbole aside, the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 has the following key provisions:

- One year after its enactment, the law will permit bank holding companies to acquire banks in any state. Thirty-four states already allow this.
- After June 1, 1997, bank holding companies can convert their subsidiary banks in different states into branches of the same bank. This is called interstate branching. States have the option of allowing it before 1997, or they may "opt out" of interstate branching altogether.

The second provision may have the biggest effect on both information systems and consumers because it will repeal a portion of the McFadden Act of 1927 that requires bank holding companies to set up separate subsidiaries — and accounting systems — in each state.

Under the current regime, "If we have a Norwest [Corp. bank] account in Omaha, it is no good for cashing a check in Sioux Falls [S.D.] or in Minneapolis because each state has a separate deposit account and separate computer system," said Rep. Peter Hoagland, a Nebraska Democrat.

Consolidating those accounting systems will make banking more convenient for the 4 million Americans who commute across state lines.

— *Mitch Betts*

A New Way to Slice Up the Pie

I was preparing some graphics for an executive meeting when the vice president's secretary asked me to make a change to one pie chart. The VP wanted one of the slices to be *NEGATIVE!* Needless to say, the software had to be faked out a bit, but the result was what the VP wanted to show, so I guess everyone was happy.

Larry Schmidt
3M Co., St. Paul, Minn.

Name That Tune

A selection of computer-related songs available on numerous file transfer protocol sites on the Internet:

99 Buckets of Bits	The Day Bell System Died
I Want a New Bug	Socket Man
A is for Apple	My Data Over the Ocean
Another Glitch in the Call	Yellow Subroutine
Away in QMANGR	Gateway To Heaven
Lonely Users	The Twelve Days of Uptime
Boot It	Software for Nothing
Core Dumped Blues	Puff the Fractal Dragon
Fifty Ways to Hose Your Code	I'm a PDP-10 Wizard

Viva Vivace

For musicians not interested in the above songs, Code Musics Technology in Minneapolis has developed Vivace, a system that provides interactive musical accompaniment to a soloist performance. The system analyzes and reacts to music played by a wind or brass instrument, with a repertoire of more than 1,100 accompaniments, including classics by Mozart, Handel and Beethoven as well as Dixieland titles and jazz pieces. Musicians can choose the degree to which Vivace should follow the soloist's tempo, change key, customize practice loops and tune their instruments with the system.

Inside Lines

You can't have it all

Most of the new AS/400 operating system announced in May should ship late this year as planned, but sources said a few pieces will slip to February while IBM does additional testing. One person familiar with the project described the delayed components as "pretty esoteric," although some elements of IBM's Client Access/400 software for linking PCs to the AS/400 are on the list. Key pieces — a new file system, database and TCP/IP — will be out this year.

Beta testers offer IBM PowerPC desktop details

Internet users who claim to have beta-tested the system at their sites say IBM's first PowerPC desktop is based on the 66-MHz PowerPC 601 processor and features standard 16M-byte RAM, 540M-byte SCSI disk subsystem, 1M-byte video RAM, two Peripheral Component Interconnect slots, two ISA slots and one-half ISA slot. The system, which can boot itself unattended from a boot-up CD-ROM, will initially offer Windows NT and AIX support and is expected to cost about $2,500.

Daytona apps dress up for their debut

Within 30 days of shipping Daytona, aka Windows NT 3.5, Microsoft will ship its first 32-bit desktop productivity applications for NT. The 32-bit versions of Excel 5.0 and Word 6.0 will support NT's long file names and work with very large data files, Microsoft said.

Under the covers with Sybase and Novell

Sybase plans to disclose a bundling deal with Novell on Oct. 11. The deal, which is an effort to boost Sybase's weak workgroup database strategy, calls for Novell resellers to peddle the Sybase System 10 database with NetWare 4.0, according to an industry source. Oracle signed a similar marketing deal with Novell four months ago. Sybase officials declined to comment.

Hold on to your hardware

IBM officials confirmed that buyers of its new parallel mainframes will be able to keep their boxes and do a board-level upgrade when a faster version of the CMOS processor ships in the second quarter of 1995. As expected, processor speeds will almost double from the current 13 MIPS to 25 MIPS. The number of processors supported by the System/390 Parallel Transaction Server will also increase from 192 to 320, a size users say is more for show.

Taking the low road

As IBM, Toshiba and others announce high-end notebooks, Compaq will take the low road today when it announces the Contura 400. Sources said the notebooks will be based on Intel's 20/40-MHz 1486DX2 chip. The products will be the first full-size Conturas to feature PCMCIA with two Type II slots or one Type III slot. The Conturas will feature aggressive pricing — from $2,599 to $3,299 — with either a 9½-in., dual-scan passive-matrix screen or an 8.4-in., active-matrix color screen, sources said. The sources said an interesting feature will be a keyboard that tilts at a 5-degree angle.

Break out your kazoos

The name of the combined entity of SynOptics and Wellfleet is officially Bay Networks, Inc. The two vendors raised the ire of many analysts and reporters last week at Networld/Interop when they hosted a roughly three-hour "nonevent" to announce that the name of the merged company was not — as Cabletron and Cisco representatives are fond of saying — going to be "WellFloptics."

As a crowd of Networld/Interop attendees gathered around Microsoft's first public demo of its Hermes Systems Management Server product last week, a number of people began chuckling. The reason? A rather subtle typo in a text bullet that was supposed to read "... user having trouble with his floppy disk." Alas, the final 's' had somehow become the third letter of the alphabet. To alert Computerworld about our own typos, or better yet, to pass along news items or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.

How to contact *Computerworld* editors:

	Phone:	Fax:
Main office, Framingham, Mass.	(508) 879-0700	(508) 875-8931
24-hour tip line	(508) 820-8555	
Mid-Atlantic bureau, Rochelle Park, N.J.	(201) 587-0090	(201) 712-1808
Washington bureau, Washington	(202) 347-0134	(202) 347-2365
Midwest bureau, Des Plaines, Ill.	(708) 827-4433	(708) 827-9159
West Coast bureau, Burlingame, Calif.	(415) 347-0555	(415) 347-6831
Northwest bureau, Bellevue, Wash.	(206) 641-7770	(206) 747-1021

☞ **Electronic mail:** *Computerworld*'s writers and editors have individual **MCI Mail** accounts. Most of our staff members can be reached on MCI Mail by addressing messages to their first and last names as they appear on the masthead, which is opposite the editorial page. For a complete list of editorial MCI Mail addresses, message Linda Gorgone at 597-8014.

☞ Our **CompuServe** account number is 76537,2413. Please use that account only for communications with writers and editors. Computerworld cannot guarantee response to all inquiries. Direct subscription inquiries to CompuServe: 73373,1230.

☞ **Letters to the editor** and other editorial-related messages can be sent via **Internet** to letters@cw.com

☞ **Client/Server Journal:** Contact Editor Alan Alper at (508) 820-8115 or via Internet at aalper@cw.com

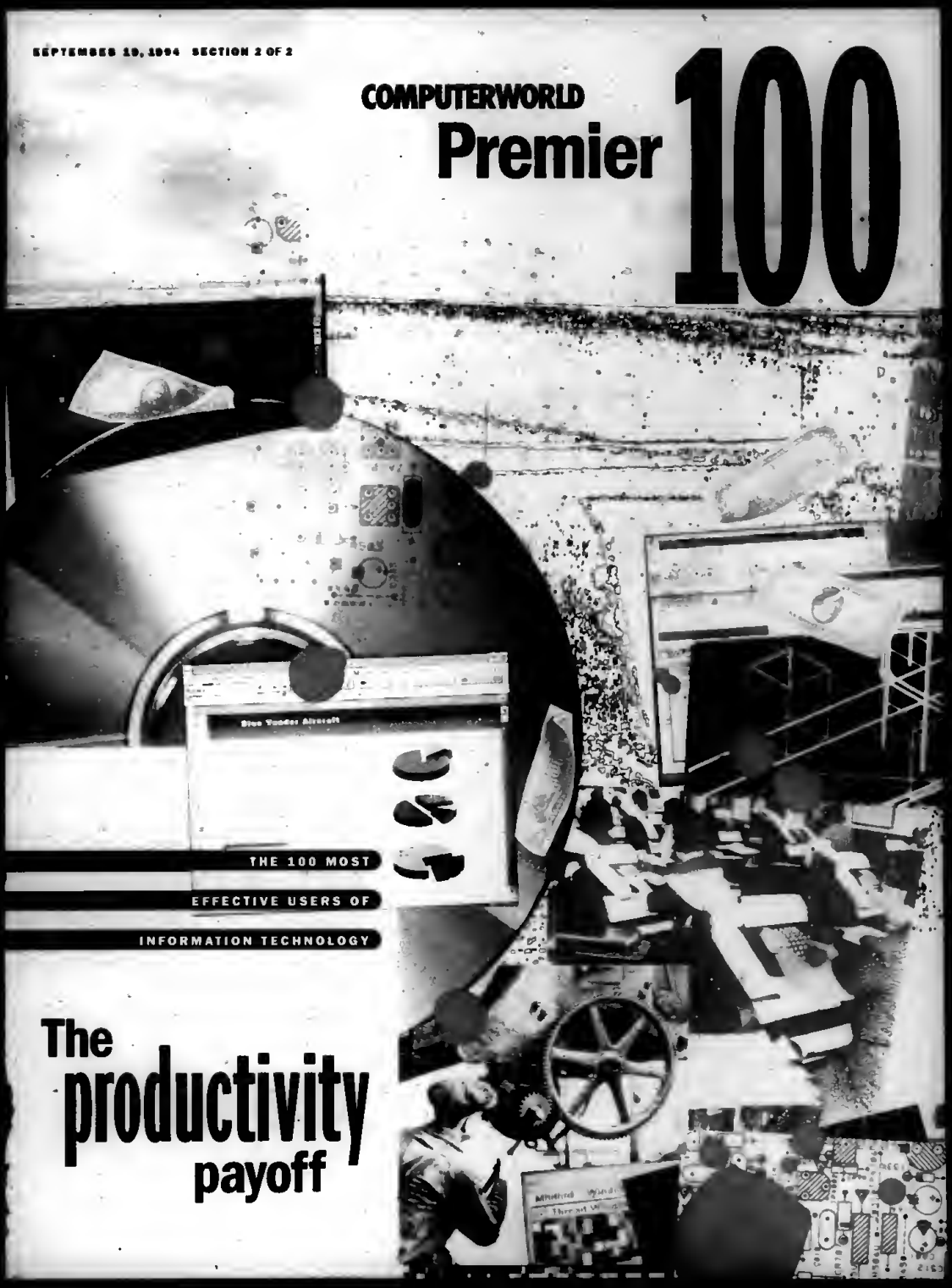
☞ **Subscriptions:** Inquiries and changes of address should be sent to P.O. Box 2043, Marion, Ohio 43305-2403 or call (800) 669-1002.

☞ **Reprints:** Contact Sharon Bryant at (508) 820-8125.

☞ **Rapid Reference clipping service:** (800) 343-6474 x554.

SEPTEMBER 19, 1994 SECTION 2 OF 2

COMPUTERWORLD Premier 100



THE 100 MOST EFFECTIVE USERS OF INFORMATION TECHNOLOGY

The productivity payoff

Legacy systems. Network growth. Mounting cost-pressures. ◆ Compared to the challenge of running the World Cup games, these computing issues make for a pleasant day at the office. ◆ No other organization had to come together so quickly, move so rapidly, in so short a time, as this summer's World Cup games. ◆ Indeed, it was the world's largest, most watched, virtual corporation. ◆ And behind it all, running the whole thing, was the world's largest client/server network ever used for a single sporting event. ◆ More than 1,000 Sun workstations using the Solaris operating environment were networked with 15 Sun servers, including two SPARCcenter 2000 servers with over 32 gigabytes of disk storage. ◆ Sun's networked computing coor-

THE SPECIAL CHALLENGE OF RUNNING A BUSINESS THAT SAYS

"KICK ME"

dinated and executed field operations for 24 World Cup teams that played in four different time zones. The entire business operation of the World Cup games — more than $1 billion — was run on Sun systems. ◆ And, remarkably, the entire network was installed in less than four months. ◆ Which may be why, as soccer fans cheered the Brazilian champions, computer fans cheered a computing system that proved simple enough to manage, yet powerful enough to run, the world's largest sporting event. ◆ More than 135,000 businesses are using Sun systems, powered by the SPARC* chip and the Solaris operating environment, to gain a competitive advantage. To learn more, call 1-800-426-5321, ext. 755. Or, on the Internet, access Sun's World Wide Web server at http://www.sun.com/

Sun

Exclusive Computer Supplier
To The 1994 World Cup

* Sun Microsystems, Inc.

Computerworld Premier 100

EDITOR
Paul Gillin
RESEARCH MANAGER
Michael L. Sullivan-Trainor
MANAGING EDITOR
Catherine McCrorey
ART DIRECTOR
Stephanie Faucher
COPY EDITOR
Kimberlee A. Smith
CONTRIBUTING WRITERS
Renee Barber
Kevin Burden
Avery Jenkins
Joseph Maglitta
Kim S. Nash
Derek Slater
Craig Stedman
RESEARCHERS
Renee Barber
Kevin Burden
PRODUCTION MANAGER
Beverly Wolff
ADVERTISING COORDINATOR
Peggy Hennessy

EDITOR IN CHIEF
Bill Laberis

Copyright 1994 by CW Publishing, Inc. All rights reserved. Computerworld can be purchased on 35mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Photocopy rights: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing, Inc. for libraries and other users registered with the Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 669-1002. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $6 a copy; U.S. – $48 a year; Canada – $110 a year; Central and South America – $130 a year; Europe – $195 a year; all other countries – $295 a year (airmail service).

cover design by STEPHANIE FAUCHER
cover illustration by MARTY GUNSAULLUS

5 **Editor's note**
by Paul Gillin
This year's *Premier 100* members are doing more with less — and doing it very well

8 **Best of breed**
by Michael L. Sullivan-Trainor
Tough economic times have spawned a lot of innovation in IS spending

10 **Pressure to produce**
by Paul Gillin
The productive benefits of the trillion dollars invested in computers in the 1980s are beginning to show up — in some unexpected ways

photograph by WILLIAM MCINTYRE

13 **Defying the odds**
by Kevin Burden
No. 1 Unifi, Inc. weaves big profits and high growth out of the threads of a stagnant textile industry. A lean IS department is part of the pattern.

17 **The rest of the best**
by Renee Barber
The companies that round out the *Premier 100* Top 10 list range from railroads to biotech. But they all share an intense focus on technology's bottom-line benefits.

20 **Power of the purse**
by Derek Slater
Giving up spending control to user departments doesn't have to be a drag. Some IS operations are actually embracing the trend.

25 **Rocket man**
by Craig Stedman
Rockwell's James Sutter finds the silver lining behind clouds in the defense industry.

photograph by WILLIAM MCINTYRE

26 **Get connected!**
by Avery Jenkins
Premier 100 companies are finding that the benefits of E-mail and EDI connections are showing up in more ways than just postal savings.

33 **Bullish on technology**
by Craig Stedman
While everyone else decentralizes, Merrill Lynch's Howard Sorgen looks for savings through consolidation.

34 **Happy together**
by Joseph Maglitta
If you're lucky enough to report to the CEO, you'd better be up to the challenge.

illustration by M & D

36 **IS in his genes**
by Joseph Maglitta
Amgen, Inc.'s CEO Gordon Binder wants computing to flourish in his company's high-growth culture.

38 **Feelin' groovy**
by Paul Gillin
Our annual opinion survey shows that most *Premier 100* executives welcome new management scrutiny.

40 **Star performers**
by Kim S. Nash
Some companies far outdistance their industry peers in their Information Productivity rankings. Here's a sample of what they're doing right.

45 **How we evaluated productivity**
by Paul Strassmann
The creator of the Information Productivity Index outlines a new investment concept: Return on management.

illustration by M & D

46 **The Premier 100 at-a-glance tables**
Comprehensive tables showing how the Top 100 companies are spending their dollars in areas such as client/server, PCs and staffing.

54 **Company Index**
An alphabetical listing of *Premier 100* companies and their IS leaders.

55 **Lessons of the productivity paradox**
by Stephen Roach
The productive value of the 1980's IS investment is showing up, but why did it have to take so long?

Premier 100

the 100 most effective users of information technology

1 Unifi, Inc.
2 Illinois Central Corp.
3 Amhoc, Inc.
4 AMA Group, Inc.
5 UST, Inc.
6 Fluor Corp.
7 MAPCO, Inc.
8 MBNA, Inc.
9 U.S. Healthcare, Inc.
10 Angus, Inc.
11 Newmont Mining Corp.
12 Cooper Tire & Rubber Co.
13 Great Lakes Chemical Corp.
14 Abbott Laboratories
15 International Flavors & Fragrances, Inc.
16 The Bear Stearns Cos.
17 Walt Disney Co.
18 CSF Holdings, Inc.
19 Ace Hardware Corp.
20 Waste Management, Inc.
21 Collective Bancorp, Inc.
22 Schering-Plough Corp.
23 Fruit of the Loom, Inc.
24 Morgan Stanley Group, Inc.
25 American Home Products Corp.
26 Cone Mills Corp.
27 Merck & Co.
28 Briggs & Stratton Corp.
29 Merrill Lynch & Co.
30 Boston BancCorp.
31 Sunbeam-Oster Co.
32 Salomon Brothers, Inc.
33 Coca-Cola Co.
34 Bristol-Myers Squibb Co.
35 Premark, Inc.
36 Charles Schwab Corp.
37 Gannett Co.
38 GEICO Corp.
39 Levi Strauss Associates, Inc.
40 Dillard Brothers, Inc.
41 Gerber Products Co.
42 Rubbermaid, Inc.
43 Medtronic, Inc.
44 American President Cos.
45 H&R Block, Inc.
46 Raytheon Co.
47 Kellogg Co.
48 Worthington Industries, Inc.
49 United Healthcare Corp.
50 W. M. Wrigley Jr. Co.
51 Johnson & Johnson
52 Newell Co.
53 NALCO Chemical Co.
54 Lancaster Colony Corp.
55 EQystems, Inc.
56 Nike, Inc.
57 Advanta Corp.
58 Southwestern Bell Corp.
59 Travelers Corp.
60 Charter One Financial, Inc.
61 Gap, Inc.
62 Valspar Corp.
63 Bankers Trust New York Corp.
64 McDonald's Corp.
65 Reebok International Ltd.
66 First Commerce Corp., LA
67 Sigma Aldrich Co.
68 Thiokol Corp.
69 JP Morgan & Co.
70 Rockwell International Corp.
71 Emerson Electric Co.
72 CPC International, Inc.
73 IDS Financial Corp.
74 H. J. Heinz Co.
75 3M Co.
76 Fifth Third Bancorp
77 Ameritech Corp.
78 Rhone Poulenc Rorer, Inc.
79 General Mills, Inc.
80 PaineWebber Group, Inc.
81 Turner Corp.
82 Hon Industries, Inc.
83 MBNA Corp.
84 General RE Corp.
85 First Virginia Banks, Inc.
86 Allergan, Inc.
87 Leggett & Platt, Inc.
88 May Department Stores Co.
89 Hershey Foods Corp.
90 Hillenbrand Industries, Inc.
91 Stewart & Stevenson Services
92 Tribune Co.
93 Reader's Digest Association, Inc.
94 Wal-Mart Stores, Inc.
95 Sonoco Products Co.
96 Gillette Co.
97 Werner Enterprises, Inc.
98 Avon Products, Inc.
99 Dover Corp.
100 Upjohn Co.

The Editor

More for the money

Do more with less.

It's the business mantra of the '90s. Recession and decentralization have wreaked havoc on corporate hierarchies. Layoffs have eroded the bonds of trust between employer and employee. Globalization has expanded competition beyond U.S. shores.

All this has hit corporate IS hard. Technology has become a deluge, with project cycle times measured in days. Meanwhile, management is increasingly suspicious of the productive value of the computing investment. Service sector productivity was flat during the 1980s, and CEOs are rightfully asking whether the trillion dollars U.S. business spent on computers will ever pay dividends.

It was with this new reality in mind that we substantially revised the selection criteria for this year's *Premier 100* ranking.

Throughout the previous six years of the *Premier 100*, we used a metric that favored companies that spent heavily on IS, invested in end-user computing and also achieved high profitability.

Noble goals, but not in line with the realities of the '90s. We decided this year to revamp and simplify the selection criteria for the *Premier 100* to recognize companies that spend the least on IS and get the greatest business value.

To assemble the rankings, we turned to Paul Strassmann, a veteran CIO and one of the leading authorities on the productivity of the IS investment. Strassmann's Information Productivity Index enabled us to select the *Premier 100* based on publicly available data. For a detailed methodology, see his introduction to the charts on page 45. We then surveyed the Top 240 companies so we could compare those in the Top 100 with others that finished in the second tier. Our goal was to find out what these effective users are doing right.

On the following pages, you'll see what we learned. The *Premier 100* are doing more with less, and they're doing it well.

THE PREMIER 100 TEAM (from left to right): Michael L. Sullivan-Trainor, Kimberlee Smith, Catherine McCrorey, Stephanie Faucher, Kevin Burden, Renee Barber and Paul Gillin

We are interested in hearing your reactions to the *Premier 100*, our selection method and the special issue you're now reading. Contact me directly at (508) 620-7724 or, if the Infobahn is your thing, send me a message via MCI Mail at 575-4120 or the Internet at pgillin@cw.com. □

Paul Gillin

PAUL GILLIN

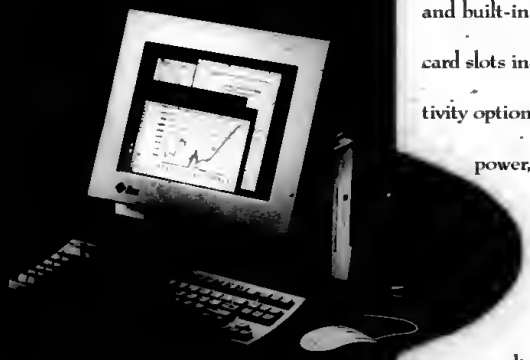
would like to thank Paul Strassmann for his advice and assistance on this project. We are also grateful to the [illegible] Database Division and Computer Intelligence for providing research assistance. And special thanks to all the IS executives and their staffs for enduring many phone calls and requests for information during what should have been a normal summer.

illustration by M A D *photograph by* RALPH MERCER

For those who wish not merely to seize the day, but to seize it elegantly, we present a workstation uniquely suited to the task: the new SPARCstation™ Voyager. ◆ A fully-powered, flat-screen, flicker-free, energy-efficient celebration of advanced design and engineering that puts true workstation power where it belongs: wherever you'd like it. ◆ At just 5.5 inches deep, the SPARCstation Voyager fits any size desktop, yet delivers real power to multitask, run advanced graphics, and share voice, video and data

NO LAW SAYS YOU CAN'T CRUISE THE INFORMATION SUPERHIGHWAY WITH A LITTLE STYLE.

with colleagues. ◆ Advanced networking capabilities help you connect to the world, and the world to you. An ingenious infrared interface, for example, lets you "beam" data back and forth



between hand-held computers, and built-in ISDN and PCMCIA card slots increase your connectivity options. ◆ Yet, for all this power, the SPARCstation Voyager occupies a tactful one-third the desk space of an ordinary workstation. It even whispers as it runs, thanks to an advanced convection-cooled design that eliminates cooling-fan noise. ◆ The SPARCstation Voyager. The consummation of advanced thinking and design that makes cruising the information superhighway not only an eminently profitable ride, but a uniquely enjoyable one, too. ◆ To learn more, cruise the net using Mosaic at http://www.sun.com/ ◆ Contact your Sun sales representative, or call 1-800-426-5321, ext. 745 for more information.

Sun

The Network Is The Computer

©1994 Sun Microsystems, Inc

BY MICHAEL L. SULLIVAN-TRAINOR

best of breed

Balancing **tight budgets** and targeted technology **spending** are keys to **success** for Premier 100 **companies**

Despite the high-growth, high-profile image of computer technology, life for the corporate information systems executive has never been tougher.

"CIOs face the paradox of keeping overhead costs down while providing the company with the greatest benefits of the latest technology," says Richard Swanborg Jr., managing director at Tradewinds, a Cambridge, Mass.-based IS management consultancy.

Our analysis of survey data from the *Premier 100* companies reveals that cost pressure is evident. The average budget as a percentage of revenue for *Premier 100* companies is 2% — about the same as for the 782 firms surveyed by CSC Index, Inc. in its 1994 budget survey (see chart).

For our second-tier companies — those that fell just below the Top 100 ranked by information productivity — the average budget percentage is 3%.

Budget growth, which in the CSC Index sample has steadily declined from 7.5% in 1989 to 2.3% this year, is also lower for the *Premier 100*'s Top 10 than for the rest of the 100 and those below the 100 rank (see chart).

Yet a miserly approach to IS alone fails to address the other side of Swanborg's paradox. IS executives must also help their companies capitalize on technology.

Take the case of Waste Management, Inc., ranked 20th among the 1994 *Premier 100*. The $7 billion-plus waste collection and disposal firm has steadily reduced IS spending in recent years, including a 26% reduction this year, yielding a $73 million IS budget.

"But we've been very effective in managing our portfolio of applications to increase functionality and still upgrade hardware," says computer services director James C. Murphy.

Murphy's law? Automate and focus.

"We're holding the line on personnel,

Going down

Companies with the highest information productivity spend a smaller percentage of their revenue on IS

PREMIER 100	AVERAGE 1994 BUDGET AS A PERCENTAGE OF REVENUE
TOP 10	1.3%
TOP 100	2%
BOTTOM 100	3%
1994 CSC INDEX BUDGET SURVEY	2%

(782 organizations surveyed)

Going up (slowly)

Top companies also advance their budget more slowly

PREMIER 100	1993-1994 BUDGET GROWTH
TOP 10	4.3%
TOP 100	8.4%
BOTTOM 100	10.2%
1994 CSC INDEX BUDGET SURVEY	2.3%

(782 organizations surveyed)

Stealth spending

But more money is going outside IS for the best performers

PREMIER 100	PERCENTAGE OF NON-IS SPENDING EQUAL TO IS BUDGET FOR 1994
TOP 10	22%
TOP 100	19%
BOTTOM 100	15.5%
ANALYSTS ESTIMATES	10-50%

Illustration by MARTY GUNSAULUS

and automation is real key to that," Murphy says. The data center is the primary focus of automation projects, which let it run more effectively with fewer staffers. The *Premier 100* companies, on average, have a low ratio (.03 to 1) of IS staffers to employees.

Sometimes the executive's balancing act is aided by business conditions.

For example, W. Ben Kuenemann, senior managing director of information services at 16th-ranked The Bear Stearns Cos., is riding the wave of 25% growth in the financial services firm's $57 billion assets from 1992 to '93 and 23% growth in its $362.4 million in profits. "We're growing so fast as a business that we're really focused on the revenue generation side as opposed to the cost containment side," he says.

But the job is subtler than blowing with the winds of financials. Keeping IS on course requires consistently tight management of the IS budget's bottom line while making discrete investments in new applications and platforms. The ability to measure return on investment (ROI) is key to this strategy. Ninety-five percent of *Premier 100* executives rated ROI measures as very important to getting project approval.

Overall, the *Premier 100* survey shows the need to keep certain new investments as high as business conditions permit while holding the lid on infrastructure growth. Hardware investments are only 15% of the budget, on average, while new development consumes more than 50%. Client/server garners 41% of system development spending.

In addition to the resource distribution challenge, top IS executives create policies that keep their staffs and peers aimed at the right targets.

Amgen, Inc., ranked 10th, uses a highly decentralized IS structure to support its biotechnology breakthroughs, but Bruce D. Whetstone, director of corporate information technologies, does have veto power. "I don't use it as a club, but I will challenge certain acquisitions," he says.

AVOID TUNNEL VISION

Another valuable lesson learned from top IS executives is to pay attention to the architecture over the long term. Bankers Trust New York Corp., ranked 63rd, has been nurturing an architecture based on distributed computing, consistent platforms and application interoperability for 10 years.

Now, with profits up 30.7% to $996 million and assets up 27.1% to $92 billion, the bank is spending richly on client/server. The $550 million IS budget is up 18%, with 80% of the investment in new development on client/server.

"Many people equate client/server with downsizing," says Lyle Anderson, the bank's vice president of technology strategic planning. "That's not what we're doing. We're doing client/server on industrial-strength platforms and building our own middleware to allow interoperability."

Fifty-eight percent of *Premier 100* executives say architecture is extremely important to their strategies.

Yet regardless of strategy, *Premier 100* IS execs have the same objective. "It absolutely concerns me that we're making people more productive," says Patrick Zilvitis, vice president of corporate information technology at 96th-ranked Gillette Co. "If we aren't, we shouldn't do what we're doing." □

Sullivan-Trainor is a Computerworld editor, CW Guide.

Technology shift

Client/server investments claim a large piece of development for all companies

PREMIER 100	CLIENT/SERVER PERCENT OF DEVELOPMENT BUDGET
TOP 10	
TOP 100	
BOTTOM 100	

Although the Top 10 Premier 100 companies devote a lower percentage of their development budget to client/server, they rated it 3.9 on a five-point scale, where five is most important. The Top 100 companies rated it 3.8. The Bottom 100 companies rated it 3.9.

pressure produce

Is IS making us **more productive?**

The answer, **finally,** may be **yes**

BY PAUL GILLIN

Unifi, Inc. recently equipped 20 salespeople with $3,000 worth of laptop gear each. These salespeople now have more current and relevant information available to them and can upload sales orders directly to headquarters. But has the $75,000 investment in hardware, software, support and training made them more productive?

"That's a tough one," says Jerry Moore, vice president of MIS at Greensboro, N.C.-based Unifi. "Our management has bought off on the project because the information's more timely. But I don't know that we can break down [the benefit] into dollars and cents."

Unifi's situation isn't unusual. Corporate information systems departments are finding it harder and harder to justify the productivity benefits of large projects using age-old criteria such as return on investment (ROI) or return on assets. New classes of systems projects — for example, groupware, decision support and data warehousing — are forcing the issue of how to measure benefits when the benefits are fuzzy criteria such as improved customer satisfaction.

But *Premier 100* IS departments are learning to cope. IS executives say they are relying more than ever on business unit partners to throw their weight behind systems projects, and they're learning how to use new metrics that show heretofore hidden benefits of the IS investment.

Experts say the big measurement problems stem from the question of how to measure business value. "The problem with value is that it's undefined," says Thornton May, vice president of research and education at Cambridge Technology Partners in Cambridge, Mass. "There's nowhere on your balance sheet for defining how smart your people are or how fast you get to market."

"White-collar productivity studies are almost impossible to do," says Erik Brynjolfsson, assistant professor of management at MIT in Cambridge, Mass., and author of a 1993 study on the topic. "It's hard to quantify quality, variety, customer service and responsiveness. But these are things that in-

illustration by LARRY GOODE

formation technology contributes to a lot."

It's sometimes called the productivity paradox. Corporate America spent about a trillion dollars on computing in the 1980s, while nonmanufacturing productivity stayed almost flat. *Fortune* magazine opined last year that "information technology is already one of the most effective ways ever devised to squander corporate assets." The magazine pointed out that spending on IS has nearly doubled as a percentage of U.S. capital investment in 12 years, with virtually no productivity results to show for it.

SHIFTING PARADOX

However, opinion is clearly beginning to shift on the productivity paradox. Recession and global competition have forced U.S. companies to finally use the technologies they put in place during the past 10 years with corresponding productivity leaps. Business managers are more convinced than ever of the computing payoff potential.

Recent research has demonstrated that the payback is finally arriving, but *Premier 100* IS directors say the black eye IS got during the Trillion-Dollar Decade, combined with tighter IS budgets in general, forces them to justify computing expenses more than ever.

"We do a strict return on investment analysis on every project over $75,000," says the chief information officer of a major Midwestern industrial company who asked not to be named.

"If we can't justify an investment on hard dollars, we get the management together and present the facts. If management buys it, we do the project," Unifi's Moore says. "But it's known up front that there aren't hard dollar returns."

But *Premier 100* CIOs also say the productivity question has become a moving target. With fewer and fewer IS projects providing simple cost savings by replacing people, savvy IS people are shifting the responsibility to end-user departments. As a result, users are increasingly paying for their own computing needs (see story page 20), and IS chargeback is staging a revival.

"We charge out everything we do," says W. Ben Kuenemann, senior managing director of information services at The Bear Stearns Cos. in Whippany, N.J. "Why should I be held responsible for the productivity of the user community?"

Like many financial firms, Bear Stearns enjoys a tight link between the IS function and business departments. "In this business, until we can automate a product, we don't *have* a product," Kuenemann says.

That makes it easier for the firm to build systems that don't have hard dollar deliverables. For example, the firm is now building a common workstation front end for its traders that has slick editing and validity checking along with automatic routing of trade orders. The payback: improved control, reconcilement and consistency but not necessarily cost reduction.

Tribune Co. in Chicago recently undertook a large database marketing system project without going through an ROI process, according to John Kazik, senior vice president of IS. Kazik says executives believe in the project on a gut level. "We just felt it was important to the future for us to have direct, targeted delivery of information."

USER ACCOUNTABILITY

The importance of business-level accountability reverberates during interviews with *Premier 100* CIOs. Too many IS directors were burned by spectacular systems failures and overblown expectations during the '80s, they say. Now the expectation is that the user should take the credit — or blame — for the payback of the project.

"We allocate [information technology] resources based on the business plan," says Don Schuman, vice president of IS at Ace Hardware Corp. in Oak Brook, Ill. "Once the officer responsible for the functional area decides this is a priority, he gets the resources to do it."

Ace has installed a new replenishment system for its 14 distribution centers, each of which stocks more than 60,000 items. The system's decision support tool is used by fewer than a dozen people and was almost impossible to justify on an ROI basis, Schuman says. The business managers had to see the value. "Did we eliminate rebuying people? No. Did we increase inventory turnover? Yes. Was it because of the system? We don't exactly know, but inventory turn did improve, and that's what counts to the business manager," he says.

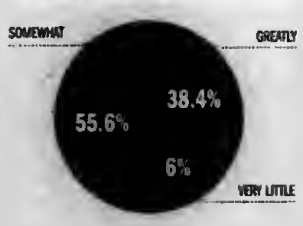
Those who believe in the IS productivity payoff generally agree that the reason the benefits of investment haven't shown up is that statisticians are measuring the wrong thing. Output of widgets per hour is a lousy measure of white-collar worker productivity, they say, particularly when corporations are automating production jobs out of existence but actually adding office staffers to administer the automat-

continued on page 12

More for the money

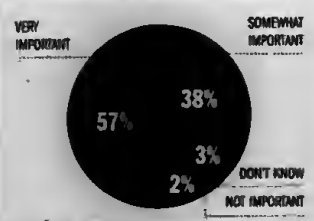
Premier 100 executives are seeing a productivity payoff . . .

How much do you think your company's information technology investment has enhanced white-collar productivity?



. . . but are still cautious in how they spend money on information technology

How important are return on investment criteria to justifying new projects?



Source: *Premier 100* survey

◆ continued from page 11

ed systems on the factory floor.

"Our total inventory isn't down from 10 years ago, but we are carrying more products," says John Mitchell, director of IS at Cooper Tire & Rubber Co. in Findlay, Ohio. "Today, we're twice as big a company, and we carry three times as many products. Our white-collar workers do more than they used to do."

One reason that criticism of IS as a financial black hole is finally softening is that the recession highlighted benefits of the information technology investment that no one had even seen before, productivity advocates say.

"I contend that all the PCs and voice mail and cellular phones and such we've installed in the last 10 years have enabled the cost reductions we're seeing throughout the country," says Tribune's Kazik. "Companies are saying we don't need all these white-collar people anymore, and that's because of information technology."

Kazik's conviction is shared by Jerry Loev, president of CSC/Impact, a new IS management consulting arm of Computer Sciences Corp. Loev says IS got a bad rap during the booming '80s — not because the productivity benefits weren't there but because there was no need to take advantage of them.

"How were we able to do all this downsizing, particularly in the middle management layers, all of a sudden?" Loev asks. "I think the answer may be that that trillion-dollar investment [in the 1980s] was worthwhile, and one reason we didn't get the payoff then was that companies didn't have to take those drastic personnel actions."

Loev contends that the flattening and decentralization that has gone on in corporate America in the past five years has been enabled by the availability of cheap, powerful technology. Moreover, computers have enabled businesses to enter new markets more quickly because of the reduced need for administrative support and the availability of better information.

What's more, the payoff usually doesn't come so much from the direct application of technology as from the process changes that technology inspires. Unifi's installation of an imaging system revealed that a large amount of employee time was being spent shuffling paper, Moore said. As a result, invoice reconciliation was shifted to an automated system.

According to Cambridge Technology Partners' May, group-oriented technologies such as LANs and shared databases can reveal assets a company never knew it had. "Companies will go out and pay high prices to get intellectual assets that they already have but don't know about," he says. "When you can now communicate point to point throughout the organization, you can find out more easily where these resources are."

Productivity figures also fail to measure opportunity costs, which CIOs say are an increasingly important driver of IS investment. "Putting in a phone line to let an outside shipper access our credit system will cost us $12,000 a year," Unifi's Moore says. "Is that worth doing? Well, one bad credit decision will cost us far more than that."

In fact, lost opportunity is becoming a major selling point for new projects. IS executives point out that intangibles such as happy customers and quick delivery times translate into repeat business and, ultimately, bigger profits. And end users empowered by decision support and analysis tools are more likely to steer companies toward new opportunities that otherwise would never have been seen.

Ultimately, a chief executive officer who is passionate about the business potential of technology is an IS manager's best friend.

"Our top management is not in love with [information technology], but they are very adamant about quality, customer service and being low cost," Cooper Tire's Mitchell says. "We pursue every investment with that in mind." □

Gillin is Computerworld's editor.

for more info

Here are some sources for more information about information systems and productivity:

"HOW TO BOLSTER THE BOTTOM LINE," by Stratford Sherman, *Fortune* (Information Technology Special Report), September 1993.

"IS INFORMATION SYSTEMS SPENDING PRODUCTIVE? NEW EVIDENCE AND NEW RESULTS," by Eric Brynjolfsson and Lorin Hitt, *MIT Working Paper*, September 1993.

"INFORMATION TECHNOLOGY AND ORGANIZATIONAL PERFORMANCE," by Vijay Sethi and others, *Information and Management 25*, 1993.

"IT ENHANCES ORGANIZATIONAL PRODUCTIVITY: FACT OR FANTASY?" by Doris G. Duncan, *Information Executive*, Sept. 22, 1991.

"SERVICES UNDER SIEGE — THE RESTRUCTURING IMPERATIVE," by Stephen S. Roach, *Harvard Business Review*, September-October 1991.

THE BUSINESS VALUE OF COMPUTERS, by Paul Strassmann, Information Economics Press, 1990.

COMPUTERS AND PRODUCTIVITY, by Michael Dertouzos, MIT Press, 1989.

"AN ASSESSMENT OF THE PRODUCTIVITY IMPACT OF INFORMATION TECHNOLOGY," by Gary Loveman, MIT Management in the 1990s program, July 1988.

SAVE OVER $8

COMPUTERWORLD

Professional Courtesy Discount

51 Issues for ~~$48~~. *Now only $39.95*

YES, I want to receive my own copy of COMPUTERWORLD. I accept your offer of $39.95* for 51 weekly issues That's a savings of over $8.00 off the basic rate.

Address is ❑ Home ❑ Business Basic rate $48 per year *U.S. only

Canada $95, Mexico, Central/South America $150, Europe $295 all other countries $295 Foreign orders must be prepaid in U.S. dollars

Name

Title

Company

Address

City State Zip

Recycled Paper

Please complete the information below to qualify for this special offer

1. BUSINESS/INDUSTRY (Circle one)
   10. Manufacturer (other than computer)
   20. Finance/Insurance/Real Estate
   30. Medical/Law/Education
   40. Wholesale/Retail/Trade
   50. Business Service (except DP)
   60. Government - State/Federal/Local
   65. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agriculture
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   90. Computer/Peripheral Dealer/Dist./Retailer
   95. Other_____ (Please Specify)
2. TITLE/FUNCTION (Circle one)

   IS/MIS/DP MANAGEMENT
   19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   21. Dir./Mgr. MIS Services, Information Center
   22. Dir./Mgr. Network Sys. Data/Tele. Comm. LAN Mgt. /PC Mgt., Tech Planning, Admin Services
   23. Dir./Mgr. Sys. Development, Systems Architecture
   31. Programming Management, Software Developers
   41. Engineering, Scientific, R&D, Tech. Mgt.
   60. Sys. Integrators/VARs/Consulting Mgt.

   CORPORATE MANAGEMENT
   11. President, Owner/Partner General Manager
   12. Vice President, Asst. VP
   13. Treasurer Controller Financial Officer

   DEPARTMENTAL MANAGEMENT
   51. Sales & Mktg. Management
   70. Medical Legal Accounting Mgt.

   OTHER PROFESSIONAL MANAGEMENT
   60. Information Centers/Libraries, Educators, Journalists, Students
   90. Other Titled Personnel
3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

   Operating Systems
   (a) Solaris (e) Mac OS
   (b) Netware (f) Windows NT
   (c) OS/2 (g) Windows
   (d) Unix (h) NeXTstep

   App. Development Products
   ❑ Yes ❑ No

   Networking Products
   ❑ Yes ❑ No

E4PJ4-X

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 55 MARION, ON 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
PO BOX 2044
MARION OHIO 43306-2144

defying the odds

BY KEVIN BUROEN

In the textile industry in which foreign competition has buried 80% of the U.S. firms in the past 25 years, the success of Unifi, Inc is almost miraculous

Ranked tops among the Fortune 500 for sales growth — 147% from 1991 to 1992 — and No. 8 for the highest total return to investors over a 10-year period, Unifi controls 60% of the domestic polyester textured-yarns market and 15% of the European market. Since its inception in 1971, the Greensboro, N.C., company has never had a losing year.

One secret of its success lies in the company's "Quality through Pride" slogan, which is fervently embraced by its 4,700 workers.

Another is fanatical devotion to cost control. In a market in which price is a major competitive factor, Unifi has consistently kept its sales and administrative expenses below 3% of net sales for several years — evidence of a very lean company that has been able to underprice most of its competition.

That attention to doing a lot with a little earned Unifi the top spot in this year's *Computerworld Premier 100*.

♦ **UNIFI'S JERRY MOORE** maintains a corporate philosophy that technology is a strategic tool

WEAVING SUCCESS

Unifi is riding success in polyester, nylon and cotton textiles into new markets. In 1991, the company virtually doubled in size when it bought its largest competitor, Macfield, Inc., with a $360 million stock swap. Less than two years later, Unifi entered the spun yarn market, one of its final frontiers, with the acquisitions of Vintage Yarns, Inc. and Pioneer Corp.

"With these deals, our product line is now complete, and we will probably be looking to acquire other spun yarn companies," says Jerry Moore, vice president of MIS.

While its mahogany-paneled executive suites and dress codes indicate that Unifi still clings to tradition, the company embraces an operational philosophy that is very New Age.

No. 1 **Unifi** rides the **growth rocket** in a mature industry by **challenging** convention

From the top down, technology is viewed as a strategic tool. Knowing workers can increase productivity only so much before they hit a wall, Unifi realized early on that if it were to continue its growth, it would need to do it through technology.

Unifi was the first company to install 900 meter/min. texturing in the late 1970s, an upgrade most textile compa-

continued on page 16 ♦

photograph by WILLIAM MCINTYRE

Meet a man with a clear vision.

The industry is rapidly changing. The competition is becoming intense. Your customers are demanding better, more affordable service. Your employees need faster, more efficient access to information.

Sound familiar? Throw in the fact that you've got 2.3 million customers spread over four states and you've got a typical day at the office for Dennis Walsh, CIO of Entergy, one of the largest electric utilities in the United States.

Making the decision.

When Walsh joined the company in December 1991, he saw that Entergy's mainframe/PC environment didn't allow for nearly enough interactivity and made custom-application development a slow, expensive process. He felt client-server computing was the way to go and tested configurations from several of the leading suppliers.

"We chose Sun because their technology offers the price/performance, flexibility, and tools to build sophisticated, networked business systems that will allow our employees to make faster, well-informed decisions," Walsh says. "The combination of SPARC chip technology and the scalability of Solaris software gives Sun a significant advantage over its competitors. We're very pleased with the products we have from Sun."

Making the move.

With 10,000 employees in more than 100 sites, Entergy needed a flexible, powerful information system environment—fast. They got it. And they got a pleasant surprise: They did it ahead of schedule.

"It's an astonishing effort in my mind," Walsh says. "We've been able to do things faster than anyone would have thought possible."

Since installing their first Sun® system in July of 1992, Entergy is currently running 33 SPARCcentet™ 2000 and SPARCserver™ 1000 systems networked to their PCs with FDDI, Token Ring, and Ethernet. So employees are now able to access, manipulate, and share information much more quickly, regardless of their location. And they're able to develop custom applications faster, keeping them a step ahead of the competition.

Walsh notes, "We're running our mission-critical applications on Sun: all our financial systems, our data warehouse, our budget system, our work-management system, and automated mapping and facilities management—everything."

Making the grade.

Typical of the man who saw how to integrate his heterogeneous, far-flung enterprise into an efficient, productive network, Walsh refuses to take all the credit. "It's easy to have a vision," he says. "You've got to have people who can deliver it."

Obviously, Entergy and Sun have just those people. "Clearly it takes a team effort to make it a reality. It's only possible with a very dedicated group of people who are willing to take prudent risks and commit to the task. And that's what has happened."

As the champion of open systems and
rightsizing technology, Sun Microsystems
established an annual award for those IS
visionaries who create an enterprise-wide
client-server solution that improves eff-
ciency, saves money, and puts technology
into the hands of the employees who need it.
Sun is pleased to congratulate the
1994 Sun Visionary of the Year award winner,
Brenda Welsh, Chief Information Officer for
Entergy. Sun will donate $10,000 to the edu-
cational institution of Ms. Welsh's choosing.
Sun
ENTERGY
Sun
The Network Is The Computer.™
© 1994 Sun Microsystems, Inc

UNIFI'S PREMIER TEAM (top): LaVern Payne, Jodi Foran, Steve Holley, Keith Gaskill, Richard Lucas, Chris Dorsett; (bottom): Roxann Hooks, Craig Wilson, Jerry Moore, Richard Stevens

continued from page 13

nies did not make until the '80s. Substantial modernization and plant automation investments increased yarn productivity at its Yadkinville, N.C., plant from 3.1 million pounds a week in the early '80s to 5.2 million pounds a week today with 400 fewer workers.

"We don't necessarily abandon the way things have been done in the past. We just first look for ways to take advantage of today's technology," Moore says.

"There was a time when we would have stacks of invoices lying around here," he adds. "Today, they are all scanned and can be printed on one sheet of paper if needed." Imaging technology implemented last summer eliminated much of the paper shuffling, bringing a greater level of efficiency to the company's sale and purchase transactions. "We were also able to use many employees in more meaningful tasks," Moore says.

With a crop of IBM AS/400s running the business, Unifi has committed 28% of its new software development to client/server. "We have several scattered systems right now but are working on an overall strategy to glue them all together," Moore says.

While he has a hard time envisioning the day when client/server will replace his core AS/400s, Moore does feel it will keep him from having to upgrade to larger boxes.

The very structure of the information systems department promotes change. Take LaVern Payne, Unifi's plans and analysis manager. His sole purpose is to question processes and evaluate how new technologies might improve them.

"I have encountered zero opposition to any new ideas or technologies," Payne says. "All I ever need to do is make the business case and show how the technology applies. Once that is done, the process moves very quickly."

ACTION FIRST

The 66-member IS staff, though the largest staff Unifi has had to date, has about two-thirds the IS staffer/employee ratio that the other *Premier 100* companies have. That is part of the reason why decisions are made so rapidly.

"Benefits are visualized rather than cost-justified," Payne says. "Our IS staff is relatively small; therefore, we cannot afford to get caught up in tons of analysis."

Once Payne completes a strategic evaluation, the project is quickly handed off to the development staff. "We do not want anyone getting bogged down here," Moore says. "Thirty days after the project is done, I want . . . them out of it."

Even with the relatively small IS staff, outside service providers are used minimally. "Only if we get bottlenecked in a project or require expertise in a certain technology area that we do not have do we turn to outside help," Moore says. "Otherwise, we do everything we can in-house and try to involve as much of our staff as possible so they feel a part of the team as well as the benefits of their efforts."

Just-in-time delivery demands from retailers require that manufacturers stay in steady contact with suppliers. Electronic data interchange (EDI) has been a part of Unifi's integrated system since 1989. Today, the company is connected to approximately 200 textile manufacturers and suppliers. About 40% of outbound customer shipments and 95% of inbound go through EDI.

While Unifi encourages innovation, it is pragmatic about it. "We have two major plants, but only one of them is networked," Moore says. "Once we get the systems fully developed and know the prototype will work, only then will we tie in the other." ☐

Burden is Computerworld's senior researcher, Firing Line/Scorecard.

Lean and mean

A 70:1 employee-to-IS staff ratio marks Unifi's low overhead approach

COMPANY	Unifi, Inc.
LOCATION	Greensboro, N.C.
INDUSTRY	Textiles
NUMBER OF EMPLOYEES	4,777
NUMBER OF IS STAFF	66
1994 REVENUE	$1.39B
1994 IS BUDGET	$6M
PERCENT OF SPENDING ON CLIENT/SERVER PROJECTS	28%

photograph by WILLIAM MCINTYRE

the rest of the

Rounding out our Top 10 list . . .

BY RENEE BARBER

Companies ranked two through 10 in the 1994 *Premier 100* come from six industries and seven states, hut all have one thing in commnn: cost consciousness. Here's a hrief look at the IS strategies of these companies.

Illinois Central Corp.

The country's 10th largest railroad company is focusing new information systems initiatives on cutting costs while improving customer support. Two years ago, Illinois Central relocated its data center from Chicago to the suhurhs in a move tn disperse IS functinns into departments and cut space costs, according to Norman Schwarz, director of technical network support. Operationally nriented transportation systems have been outsonrced, a move that Schwarz says not nnly saved costs through consolidatinn hut also allowed the firm to quickly add electronic data interchange (EDI) capabilities.

In April, the company installed an IBM ES/9000 (9221) and is now in the process of migrating applications from an aging IBM 3081 to the new system. A new personal injury claims datahase will track medical and legal cases against the firm. It is also expanding its use of handheld technologies for inventory and car repair hilling information.

Expanded EDI use ant nnly provides shipping instructinns and communication between Illinois Central and other railroads hut also allows shippers to dial in and run their own queries. The report is then sent to the shipper via mailbox or fax and allows the shipper to better plan production schedules.

Ambac, Inc.

This financial services hnlding company has made aggressive investments in technology recently to achieve its objective nf being "the premier supplier of credit enhancement and information services within the markets in which we choose to compete," according tn Chief Executive Officer Phillip Lassiter's an-

continued on page 18

FLUOR'S KEN CAIN: IS future success depends on its ability to use infrastructure Fluor has built

photograph by LARA JO REGAN

◆ continued from page 17

nual report message.

To support that charge, Ambac's IS department has developed systems for underwriting and surveillance, tracking new business and monitoring the firm's existing book of insured transactions. Ambac also attributes much of its success to the implementation of on-line services this year. Ambac IS executives declined to be interviewed.

Information services expenses for last year were $28.3 million, up 34% from 1992. However, much of the increase was due to Ambac's need to fund development of new product lines for Healthcare Knowledge Resources, a health care information services firm that its Health Care Information Services (HCIA) subsidiary acquired in 1992.

HCIA became profitable last year and contributed to Ambac's record net income of nearly $180 million on revenue of $327 million.

ARA Group, Inc.

One of the nation's largest food and diversified services firms has recently undertaken major IS initiatives designed to give business unit managers more face time with customers. The focus in ARA's food services business units is to cut administrative duties and streamline back-office work, according to John Kallelis, vice president of information technology. The company is also fine-tuning its billing system.

For ARA's food services, IS has developed a food production system that designs menus according to nutritional content, prior sales and demand. Also, IS is expanding its EDI use in its textile rental services to provide a single bill to each of its 60-plus national accounts.

A streamlining effort increased ARA's 1994 IS budget by just 2.5%, but financial support stayed strong for new software development in order to continue operational improvement. Much of IS' investment is dedicated to client/server, and its goal is to move 40% of its applications to client/server within three years.

Industry leaders

Services firms dominate the *Premier 100* list when ranked by vertical market

NUMBER OF COMPANIES	CATEGORIES OF PREMIER 100 COMPANIES
12	Financial services
11	Diversified services
10	Pharmaceuticals
8	Food
6	Commercial banks
5	Electronics
5	Savings banks
4	Chemicals
4	Retailing
3	Farm equipment
3	Metal products
3	Publishing and printing
3	Transportation
2	Apparel
2	Furniture
2	Photographic equipment
2	Plastic products
2	Soaps and cosmetics
2	Textiles
2	Tobacco
2	Utilities
1	Aerospace
1	Beverages
1	Forest products
1	Life insurance
1	Metals
1	Gold mining
1	Petroleum refining

The firm's information systems and staff are decentralized — there are only 12 corporate staffers — and Kallelis says a plan to bring business units closer together by creating "collaborative" support services throughout the corporation won't harm ARA's decentralized philosophy.

UST, Inc.

The $1.1 billion holding company for four wholly owned subsidiaries — United States Tobacco Co., International Wine & Spirits Ltd., UST Enterprises, Inc. and UST International, Inc. — continues to grow in a declining market. Sales increased 7% last year, and net earnings climbed to $349 million — a 12% gain.

Because it produces the dominant share of smokeless tobacco products in an antismoking environment, UST has been able to raise prices, maintain profits and increase unit volume.

Last year, UST continued to make investments in technology to improve quality and productivity. IS is responsible for developing and improving systems to monitor growing conditions and crop yields in the regions that supply the company's tobacco.

IS is also responsible for developing shipping systems that ensure distributors have the freshest possible supply of UST's smokeless brands in stock. These systems also monitor sales and inventory so that UST's products are brought to market in a timely manner.

Fluor Corp.

The key word at Fluor, the country's largest international engineering and construction firm, is communication. To compete more effectively in far-flung overseas operations, the company is revamping its international network. Fluor already sends some 350,000 electronic-mail messages a month. A project to expand use of Lotus Development Corp.'s Notes will grow the user base from its current size of 600 users to 8,000 during the next three years.

For the past two years, Fluor has been reorganizing IS to keep up with expanding business. All 50 worldwide offices now have a local IS manager reporting to corporate headquarters.

Director of information management Ken Cain maintains that IS' future success depends on its ability to use the infrastructure Fluor has built. Cain sees training as the key. "Instead of focusing on hardware costs, we need to focus on process cost, on training our people," he says.

Fluor is hoping to move to the friendlier Windows environment and recently staged an internal trade show to promote the move. Calling Windows an "enabler," Cain says he hopes to prod reluctant users to make the Windows jump by significantly expanding training.

MAPCO, Inc. 7

This diverse energy company is undertaking a major re-engineering initiative to become the most successful provider of quality energy and energy products.

During the past six months, MAPCO has dispersed development groups out to its business segments, which exceeded the firm's expectations for improved communications, according to Chris Scalet, vice president of IS. MAPCO has kept its shared services centralized on an IBM ES/9000 mainframe.

Currently, IS is developing a technology architecture and, to assist in the re-engineering initiative, has created a business process support services department comprised of re-engineering consultants. MAPCO hopes a new system in production will soon provide up-to-the-minute inventory and status information to shippers. The firm is "slowly migrating" to client/server, allowing vendors to lead with products that are demonstrated to be effective. Scalet says IS adopts only proved technology and lets vendors take care of most research and development.

MBIA, Inc. 8

The nation's leading insurer of municipal bonds is a "prudent company" in both business dealings and IS decisions, according to Jeff Kostiw, MBIA vice president and manager of information technology. As part of a broad move from Wang Laboratories, Inc. minicomputers to a client/server setup, MBIA increased its budget 17.5% this year. The IS function, which is now 90% centralized, will also be spread out during the next three years to bring development closer to users.

Among the projects on IS' plate right now are an accounting system to handle the increased volume of accounts for one cash management subsidiary and a fixed income trading desk to handle portfolio management.

With all that change, Kostiw says he has one big issue: "IT and the firm need to accelerate training."

U.S. Healthcare, Inc. 9

The IS department at U.S. Healthcare is now benefiting from a major initiative to boost its technology investment as it expands from its New England and Mid-Atlantic base into the Southeast. "Our systems hallmark is that we do not dabble in things. We do them in enterprise scale," claims CIO Richard Castor. Last year, its IS budget increased 18%, and there are 50 major development projects on the drawing board. Thirty percent of new development is in client/server.

IS has developed automated call centers to field the 18,000 customer calls the company receives daily, as well as EDI and imaging applications to handle 550,000 images a month. A new fulfillment processing automated system will answer customer information requests, store them in a database and automatically mail forms and letters. IS is also developing a practice management system to link doctors to the firm's patient tracking and billing. A new preferred treatment protocol system advises physicians on the latest effective treatment plans and provides pharmacists with drug use reviews.

Amgen, Inc. 10

The U.S.' largest biotechnology firm has to develop systems quickly to maintain its position in a hot market. The firm leads its industry in product launches and IS spending, according to Bruce Whetstone, director of corporate information technologies. He says the IS investment as a percentage of revenue has been almost double the pharmaceutical industry average.

The downside of the rapid growth is that Amgen has had little time to create a solid information architecture. "The one word that comes to mind to survive in this environment is 'nimble,'" Whetstone says. Flexibility at Amgen comes in the form of distributed systems spread across a decentralized organization. Whetstone directs half of the firm's IS efforts, including infrastructure and administrative systems, and the 12 business units each have their own computing manager. Whetstone handles major purchase requests. □

Barber is *Computerworld*'s intern.

U.S. HEALTHCARE'S RICHARD CASTOR: We do [systems] on an enterprise scale

photograph by Nick Kelsh

power of the purse

Some IS organizations are gladly giving up budget control

At Hershey Foods Corp., IS executives figure the amount of money spent on information systems outside of IS is a whopping 36% of the department's total budget.

Time was when end-user control like that would inspire terror in the minds of IS executives. But that isn't John Schniepp's attitude. "It's not necessarily undesirable," says Schniepp, who is manager of information technology technical services at Hershey Foods in Hershey, Pa.

Schniepp points out that so-called "shadow spending" often solves problems the IS department cannot address due to budgeting constraints. "Often it's a result of IS organizations not being able to bring resources to bear, so [instead] users solve the problem locally," he says.

Share the wealth

End-user IS spending as a percentage of IS budget runs the gamut at the *Premier 100*

Percentage of Premier 100 corporate IS spending controlled outside of IS department

HIGHEST	75%	H&R Block, Inc. and Avon Products, Inc.
	65%	U.S. Healthcare, Inc.
	63%	Advanta Corp.
AVERAGE	16%	
LOWEST	0%	11 companies

EVERYBODY'S DOING IT

Interviews with executives and *Premier 100* companies indicate that Schniepp's attitude is the rule rather than the exception. Shadow spending is becoming less and less of a panic button for top IS managers.

"It's an issue, but it's not even in my Top 10. I'm not going to go around the company, beat people up and say, 'Gimme that back,'" says Bruce Whetstone, director of corporate information technologies at biotech firm Amgen, Inc.

BY DEREK SLATER

That relatively relaxed attitude is a change from even the recent past. Shadow spending has been a pressing concern for IS executives ever since the PC started sneaking onto corporate desktops a decade ago.

"It's a continuation of a long-standing issue," says Donald Broutman, a New York-based consultant at Seer Technologies, Inc. "It used to just be a small number of users."

IS HEADACHES

The basic problem is that when users start rolling their own systems, IS has to concern itself with compatibility and support issues. Another headache is the task of keeping multiple copies of corporate data synchronized.

"It does open the door to anarchy," Broutman says.

And shadow spending is clearly going nowhere but up. A recent study of 250 Fortune 1,000 companies by Dataquest, Inc. in San Jose, Calif., found that shadow spending in user departments averages about 25% of the IS budget and reaches 60% or more in some cases.

IS managers say PCs and PC software account for the vast majority of end-user technology spending. Other factors include the move to distributed computing architectures, the explosion of non-IS personnel having computer expertise and ever easier availability of software.

IS managers say all this end-user spending is not confined to a few likely suspects; it is springing up in all sectors of the corporation. Marketing and accounting departments are buying their own systems for business intelligence analysis, while engineering and research arms often build high-powered systems for tasks such as modeling or transaction processing.

Companies with extensive overseas operations have even less control over end-user spending.

Stu Dammeyer, head of North American IS operations at Reader's Digest Association, Inc. in Pleasantville, N.Y., has a fairly easy time keeping tabs on IS purchases because operations are consolidated into a single facility.

However, Dammeyer says, "We report to one person in charge of all global [information technology] decisions. If you ask him if anyone ever snuck anything into Stuttgart, you can predict the answer: Of course."

OLD MODELS OUTMODED

All these factors mean that IS must adapt, not fight.

"Five or 10 years ago, we thought we could control everything. But now there's no way in heck to keep it all under one umbrella, so you might as well give up and find another way to cope," Amgen's Whetstone says.

Whetstone says two approaches have evolved to replace the old "command and control" model as IS forms partnerships with end users.

Some IS departments are molding themselves into service-oriented organizations, making themselves the best possible source for technical support

continued on page 24

Illustration by JENNIFER JESSE

Now! Now! Now! ◆ Does it seem that customers these days know only one word? ◆ You're not alone. ◆ Which is why more and more service companies are saying: If customers won't be flexible, the computer must be. ◆ It's what McCaw Cellular did to keep up satisfaction in a galloping business adding 50,000 customers a month. ◆ What kind of computing system can do that? Networked computing. From Sun. ◆ Sun networked computing administers, manages, and anticipates the millions of daily calls made by McCaw customers. A "rule engine" in the management system runs

THE INTOLERABLE, INSUFFERABLE, UNENDURABLE ONE-SECOND WAIT.

on a SPARCcenter™ 2000 and automatically controls the entire McCaw cellular

network. ◆ Data that used to come in printouts as tall as a man, now come in easy-to-see, easy-to-analyze information that is automatically sorted, coded, and shared with teams in 35 locations across the country. ◆ And the power of the Sun system can be matched to the growing demands of the network simply and easily. Plugging in CPU boards to the SPARCcenter 2000 quickly upgrades performance. ◆ There's more to the story, of course. Cost savings. Service and support. But, hey, that's what phones are for: 1-800-426-5321, ext. 695. ◆ More than 135,000 organizations are using Sun systems, powered by the SPARC™ chip and the Solaris™ software environment, to gain a competitive advantage. For more information, use the Internet to access Sun's World Wide Web server at http://www.sun.com/

Sun

The Network Is The Computer

© Sun Microsystems, Inc.

◆ continued from page 21

for end users who control the purse strings.

For example, McDonald's Corp.'s computing is centralized, with perhaps 95% of all hardware and 80% of all software purchases approved by IS.

However, according to Carl Dill Jr., vice president of IS, the company is not sitting back on its heels waiting for shadow spending to take off. "We're being proactive with [shadow spending] rather than trying to police it," he says.

The Oak Brook, Ill.-based fast-food chain is working to implement a client/server environment that will attract end users by providing all the functionality they need. "When we have a robust environment for them to log on to, there's very little incentive for them to go in another direction," Dill says.

While the new system will put more computing power on users' desktops, it will also automate common control functions such as backup, which users tend to neglect.

Similarly, IS managers at Hershey Foods prefer education and persuasion to enforcement.

The company has procedures in place that could permit a nearly complete crackdown on end-user technology spending. Every purchase — including PCs — must get IS approval.

However, "Pragmatically, it makes [more] sense to put forth business reasons" for complying with IS preferences, Hershey Foods' Schniepp says. "We have had situations where users have decided on a product that we don't support. In some cases we've persuaded them to stick with our product, and in some cases we haven't," he says.

SUPPLEMENTAL SPENDING

The other response to shadow spending that some *Premier 100* companies have adopted is to supplement the IS budget and aggressively introduce new technologies in the corporation.

Salomon Brothers, Inc. actively uses shadow spending to alleviate pressure on the IS budget. The financial services firm reports a 50% shadow spending rate; as Salomon pushes new technologies out to the users, the costs are passed along as well.

Jill Nathanson, vice president at Salomon, explains that as the company moves to distributed computing, each department must assume budget responsibility for its own servers and PCs.

Rather than fighting the expense, user departments have responded favorably to the accountability, she says. "They feel like they are getting only their own costs" instead of helping shoulder the burden of other departments' computing needs, Nathanson says.

Salomon's central IS group still handles all management issues and purchases all networking equipment to ensure companywide compatibility.

WILLING TO PAY

End users at other companies are equally willing to shoulder greater cost when it is accompanied by decision-making power.

Sonoco Products Co. has moved all purchasing authority and expense out to the user groups, creating "an internal market economy" in which users can choose either IS or an external service provider.

Brian Westphal, a financial analyst at Sonoco, says the change has been well-received because it allows his department to calculate more exactly the cost of working with IS. "I think it has increased the level of service as well, since they are competing with outside groups," he notes.

All in all, the shadow spending issue seems to be maturing. Rising departmental spending among *Premier 100* companies now goes hand in hand with increased cooperation between IS and user departments.

"In many cases, it ties into IS departmental projects," Dammeyer says of shadow spending at Reader's Digest. In such instances, shadow spending "is more an accounting preference," he says. "It certainly isn't hidden from IS." □

Slater is a free-lance writer based in Ashland, Mass.

"Five or **10** years ago we **thought** we could **control** everything.

But **now** there's **no way** to **keep** it all **under** one umbrella."

BRUCE WHEITSTONE

AMGEN INC

in Person

rocket man

Rockwell International's **James Sutter** finds hard times in the defense business spark productivity innovation

"Information technology is becoming very much **focused**, at least in our **company,** on the external **world.**"

BY CRAIG STEDMAN

James F. Sutter has been vice president and general manager of information systems at Rockwell International Corp. in Seal Beach, Calif., since July 1983. Rockwell earned $561.9 million on revenue of $10.8 billion in the fiscal year that ended in September 1993. Its annual IS budget is about $400 million.

CW How critical is IS productivity to Rockwell's business strategy?

SUTTER It's a particularly key part, given the changes in our industry. In the defense and aerospace sectors of the company, we've had some dramatic downsizing and increased emphasis on productivity.... The era where there was a lot of growth in the defense and space budgets is over, and that's a compelling driver that insists we have a high level of [IS] productivity.

CW What steps have you taken to improve productivity?

SUTTER Like a lot of large companies, we consolidated to a single data center, and the productivity yield was very dramatic. In the last couple of years, we've dropped our number of operations people by half. We've also attacked many of the things we do with automated software products. And I've been very pleased with what has been achieved in negotiating better terms with our information technology suppliers.

CW Are you seeing a payback?

SUTTER Our overall IS budget has come down slightly. It's $400 million total now, and it peaked at about $430 million. Investments on the desktop and in servers and LANs and people to support all that have in many ways offset the improvements in productivity that we've made. The major benefit has been [the ability] to reallocate the resources we apply to information technology to areas that are new. We're also giving our field force tools that allow them to link into their customers directly. To be able to fund those [projects] out of productivity improvements is vital.

CW Are the metrics that you use to measure the value of your IS investment changing as you put in client/server systems?

SUTTER That's probably the area that's hardest for senior management to get comfortable with. We have for many years benchmarked ourselves against other companies in the area of what it's costing us in the computing center for the amount of utilization of our mainframes. But if you get into software or LANs, it gets more gray. There are so many part-time participants who use a LAN that it's difficult to measure productivity.

CW Given the [industry] changes, is this a good time to be in IS?

SUTTER Businesses are dependent on information technology much more now, and they need good direction. Is it as much fun? I think those of us who have been in the business a long time have to get used to the fact that we will not have as much of a hands-on role, and we have to adapt. □

JAMES SUTTER: 'To be able to fund ... projects out of productivity improvements is vital'

photograph by ALAN LEVENSON

SUNOCO'S TIM KANN: EDI 'has been slow to catch on because people see it as more complex than it is'

In the Southeastern U.S., where Tulsa, Okla.-based Mapco operates a chain of convenience stores and offices, BellSouth Corp. has been Mapco's communications supplier of choice for several years.

"We do a tremendous volume with them," says Chris Scalet, vice president of information systems at the $3 billion Mapco.

And with that tremendous volume comes a tremendous amount of paperwork.

"We got reams and boxes of paper from [BellSouth] every month. Somebody had to go through all of that," Scalet says.

Recently, however, an electronic data interchange (EDI)-based re-engineering project has linked Mapco's accounting system and BellSouth's billing.

Mapco can now better analyze its communications costs and "get our people costs out of the transaction processing business and into more decision support," Scalet says. "Instead of having accounts payable clerks doing data entry, we can have them reviewing invoices and looking for irregularities and problems."

LINK UP

Mapco, like many other *Premier 100* companies, is discovering the benefits of linking to the outside world. Whether it is running complex EDI transactions or just exchanging electronic mail with suppliers and customers, electronic communications is an increasingly popular route to reducing personnel costs and better integrating information into existing information systems.

The average *Premier 100* company has 20% of its workstations connected to suppliers or customers. For some companies, particularly in the financial services industry, linkage approaches 100%.

Most of the users who were interviewed say they are growing the number of connected users but carefully. Cost and security concerns frighten some business partners, and the cost benefits of EDI in particular can be hard to calculate. IS managers point out that connecting electronically to customers can often be more expensive than maintaining the old paper-based system.

But don't look to savings on postage as

BY AVERY JENKINS

connected

the benefit of electronic linkups, they say. The big payoff is in improvements in speed, efficiency and error reduction.

"It's not a quick fix," says Roxanne Reeves, manager of the electronic commerce program at Input, a market research firm in Mountain View, Calif.

She says that to properly implement EDI, a company must be willing to change its business processes and re-engineer core applications to effectively employ EDI.

While some EDI vendors are pressing the case for EDI as an add-on to existing applications, Reeves says that approach will probably yield few, if any, benefits.

Mapco's Scalet agrees. Simply tacking an EDI front or back end on to an existing process can double the cost of transmitting the transaction, he says.

Re-engineering is a central part of Mapco's adoption of EDI. The company is currently re-engineering its data collection systems at its convenience stores to streamline and manage the flow of data from point-of-sale collection to the decision makers.

Scalet says that by moving the labor costs from transaction processing to decision support, Mapco was to free up enough manpower to justify the added per-transaction cost.

THE ADVANTAGE OF LINKS

And sometimes there's a bigger incentive for adopting electronic commerce: competitive advantage.

Electronic links to customers are "a competitive necessity" in Thiokol Corp.'s commercial business, according to Brad Stout, Thiokol's chief information officer. For example, Thiokol's $175 million Huck Manufacturing Division uses a

continued on page 32

SUNOCO'S VERN MYERS: 'We see EDI as a key enabling technology for improving our overall logistics processes'

Links between **customers** and **suppliers** are building **virtual** corporations of the **future**

photographs by WILLIAM MCINTYRE

HEY, IT'S YOUR VISION.

You can choose to use it. You can choose to ignore it. You can shape it to your business, and not your business to it.

It's the computing you've demanded all along. True network computing. It is servers with mission-critical level security. It is servers that serve more quickly and more cost-effectively than anyone else's. For the workgroup. For the department. For the enterprise. It is an operating environment with networking designed-in.

It is desktops and servers with networking designed-in. It is a scalable architecture that lets you add power by simply adding power modules.

It is an operating environment so mature financial institutions move trillions of dollars on it. It is thousands of applications for both servers and desktops. It is an ability to work collaboratively with anyone, anywhere on the network. Around the office. Around the country. Around the world. In real-time. It is high-bandwidth enterprise workstations at prices that start at $2,995.

It is a way to integrate the new systems you add, and leverage the mainframes and personal computers you already have. It is consulting and operations services that not just support, but that transfer expertise.

It is a $4.3 billion company that uses what it makes, and runs itself on this kind of open, client-server computing. It is experience that comes from selling more UNIX systems than any other company. It is network management tools to [illegible]

It is the Solaris operating environment, SPARCstation systems, SPARCserver systems, SunNet Manager, 16,000 UNIX® experts, and 8,500 applications. It is happening today. In companies such as Chase Manhattan Bank and McCaw Cellular. And across the world. It is what is truly significant in computing today.

And it is demonstrably better. Let us prove it to you. 1-800-426-5321, ext. 750. Or use Mosaic to enter the Internet at http://www.su[illegible]

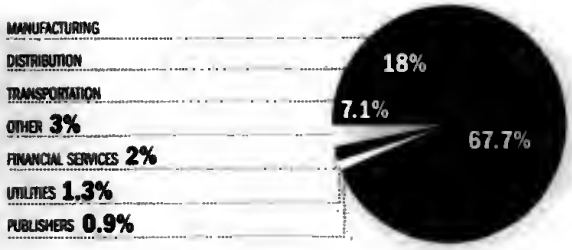
WE'VE SIMPLY FOUND A WAY TO MAKE IT WORK.

The N[illegible]

Link leaders

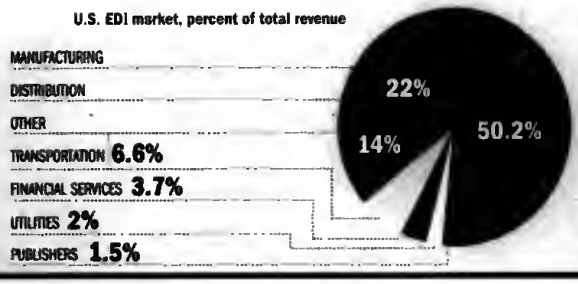
Electronic data interchange is the application of choice for intercompany networks. Discrete manufacturers are the leading users.

U.S. EDI market, percent of users



However, distributors spend proportionately more dollars

U.S. EDI market, percent of total revenue



Source: BIS Strategic Decisions, Santa Clara, Calif.

continued from page 27

just-in-time delivery system to get products to its customers.

"We got our big payoff when we integrated incoming orders onto our order management system," says Harold Borne, vice president of IS at Huck in Irvine, Calif.

Incoming EDI orders are sent to Huck's PC-based EDI translator and from there are uploaded to a minicomputer-based order-entry system. Only at that point do people come into the picture for order approval. Data entry has been virtually eliminated, and Huck is now able to fill orders faster and with less chance of error.

The system has allowed Huck to increase the number of orders it processes without increasing staff size, Borne says. More importantly, he adds, the project has satisfied Huck's drive to be easier to do business with than its competitors.

But EDI is not a panacea. Some business partners fear the technology will create security problems. Others simply don't want to spend the time and effort to learn and support it.

Greensboro, N.C.-based textile manufacturer Unifi, Inc. now manages the paperwork associated with 95% of its inbound supplies and 40% of its outbound fibers through EDI. But some of its business partners just won't use the system for security reasons, according to Jerry Moore, vice president of MIS.

Then there are the cost barriers. "Some of our smaller customers could not afford" the cost of implementing their own EDI connections, Moore says. So Unifi doesn't force the issue. "It's available, but we aren't going out and aggressively pushing it," he says.

In addition, users say EDI is difficult to justify on paper savings alone. The big payoff comes in manpower reduction and improved integration of billing information into corporate order entry, billing and accounts payable systems.

Sonoco Products Co. in Hartsville, S.C., has recently incorporated EDI into its bills of lading and payment processes to reduce labor-intensive accounting. Today, savings amount to 70 cents or 80 cents per document, or $40,000 per year, through EDI, according to Tim Kahn, Sonoco's manager of EDI.

Adds Vern Myers, corporate global traffic manager, "We see EDI as a key enabling technology for improving our overall logistics processes."

Unifi's Moore says, "I have two people processing $750 million in invoices per year."

PART OF DOING BUSINESS

In some industries, electronic customer linkups are simply a way of life. A big portion of The Bear Stearns Cos.' business is clearing trades for some 1,600 other trading firms. Customers download their files, and Bear Stearns handles the clearing process.

"In the volumes we handle, the only way we could do it is electronically," says Ben Kuenemann, senior managing director of information services.

Bear Stearns has profited from taking the in-house system it developed to clear trades and making it available to other traders.

Yet despite the inherent difficulties — political, financial and technological — these users say the migration to EDI is worth the effort.

"EDI is like a little piece of cheese in a sandwich," Input's Reeves says. "You may not see it, but without it things aren't going to work."

"It has tremendous benefits, but it's been slow to catch on because people see it as more complex than it is," Sonoco's Kahn says.

"We see EDI as not an end in itself but as a way to facilitate strategic partnerships," Thiokol's Stout says. "We have more and more alliances where EDI is going to be an integral part of that relationship." □

Jenkins is a free-lance writer based in Ansonia, Conn.

in Person

bullish on technology

Merrill Lynch's **Howard Sorgen** keeps investment firm's eye on the ball

"There's never been a more **challenging** time or more **opportunities** to do good things in **delivering technology."**

BY CRAIG STEOMAN

Howard P. Sorgen, 55, is senior vice president and managing director of global systems and technology at Merrill Lynch & Co. in New York, which earned a $1.4 billion profit on net revenue of $10.6 billion last year. Its annual information systems budget is about $900 million.

CW You've consolidated 11 data centers into two in recent years. What else have you done to improve IS productivity?

SORGEN We standardized software [across operations], so between both the physical and logical consolidations we tore out a lot of facilities and removed 40% of the work force in the host-based processing environment. We also took all of the application development people responsible for host-based production systems and put them in one central group. That's dramatically reduced the cost of maintaining the production systems as well.

CW You also centralized other parts of IS to regain control over the cost of departmental projects. Is that working?

SORGEN A year ago, we took all of the groups that were dedicated to developing applications for specific business units and put them together... In effect, we've gone back to basics. We're now heavily centralized. The cost savings has been that we don't have to build utility-type functions for individual units. We operate from a common pool.

CW How much money have you saved with all the changes?

SORGEN I would look at it more from a reinvestment standpoint than a pure reduction. We saw that we were going to migrate to client/server platforms and felt it was incumbent on us to self-fund part of that investment by reducing the cost of the host-based processing environment. We actually reduced our [mainframe] cost base 45%, but we reinvested [about half] of that into client/server.

CW Your IS head count has come down from about 3,000 to 2,100. Are more reductions planned?

SORGEN Actually, we see that number going up before it comes down. We're rolling out more and more [client/server] applications as we speak, and human resources to support that are an ongoing need. But the budget is likely to remain flat as we rip out infrastructure. We need continuing cost reductions, so we don't go hog-wild as a percentage of revenues.

CW Is this a good time to be in IS?

SORGEN I think there's never been a more challenging time or more opportunities to do good things in delivering technology. But I've seen a lot of trepidation on the part of CIOs. A lot of CIOs have accepted caretaker situations and been reluctant to step up to the plate and do the job they're supposed to do, [which is] to manage applications development and deliver those to your customers. They become a "facilitator," or something like that. Those words mean nothing to me. They don't accomplish anything. □

HOWARD SORGEN: 'We've gone back to basics'

photograph by JOHN RAE

CIO JAMES MARSTON AND CEO JOHN LILLIE of American President Cos. occupy cubicles on the re-engineering front lines

Talk about close: When James S. Marston wants to talk with his boss, he needn't trudge to the executive suite or call days ahead for an appointment.

Instead, Marston, chief information officer at Oakland, Calif.-based American President Cos., walks a few steps and sticks his head into a nearby cubicle.

"I've been spending three or four hours a day down here with the re-engineering team," says John A. Lillie, chairman and chief executive officer. The $2.6 billion international transport company is redesigning its entire business, from order entry to service. "Jim and I sit close together."

What's this? Top executives and CIOs as cube neighbors? Aren't most CEO/CIO relationships more like king and royal alchemist — an arm's-length mix of mutual dependency, suspicion and bewilderment? Not if you look at this year's *Premier 100*.

Some of the fastest-growing, most innovative (and profitable) global companies feature cheek-to-cheek partnerships between the information systems head and the big boss.

Whether such a setup thrills you or terrifies you is another matter. But those involved say the arrangement works smashingly. Drawing IS into the inner circle, they say, can reduce miscommunication, improve credibility and alignment for IS and, ultimately, boost the bottom line.

"We regard technology as an opportunity to gain competitive advantage," Lillie says of his 6,000-employee firm. Marston sits on the company's executive committee alongside five other top operating and administrative executives.

How do these happy couples not only avoid bites and burns but also steer some of the nation's most technology-savvy companies?

• **The right environment.** Before they can stay close, executive partners must get close. Often, that means a flat company in an information-intense industry such as finance, health care or transportation.

Company culture must also be right. Take Nalco Chemical Co., a

American President Cos., RANK 44
James S. Marston, Senior V.P. & CIO
John M. Lillie, Chairman, CEO & President

First Virginia Banks, Inc., RANK 85
Shirley C. Beavers Jr., President
Robert H. Zolokar, Chairman & CEO

GEICO Corp., RANK 38
Simone J. Pace, Senior V.P. & CIO
O. M. Nicely, CEO

H&R Block, Inc., RANK 45
Judy Keisling, V.P., Information Services
Harry Buckley, President & CEO

IDS Financial Corp., RANK 73
Jack Thomas, Senior V.P., Information & Technology
Dave Hubers, CEO

Johnson & Johnson, RANK 51
Ronald Morris, V.P., Information Technology
Ralph Larsen, Chairman & CEO

MBNA Corp., RANK 83
Ronald W. Davies, Vice Chairman & CTO
Charles M. Cawley, Chairman & CEO

Merrill Lynch & Co., RANK 29
Edward L. Goldberg, Executive V.P.
Daniel P. Tully, Chairman & CEO

Reader's Digest Association, Inc., RANK 93
Kenneth A. Nelson, V.P., MIS
James P. Schadt, COO/CEO

Tribune Co., RANK 92
John Kazik, Senior V.P., Information Systems
Charles Brumbeck, Chairman & CEO

United Healthcare Corp., RANK 49
James P. Bradley, Senior V.P. & CIO
William McGuire, CEO

happy together

These **lucky CIOs** report **directly** to the **top** boss. But **success** requires **poise and personality.**

BY JOSEPH MAGLITTA

$1.5 billion specialty manufacturer in Naperville, Ill. A quality program begun in 1987 "has encouraged much more open communication," says CEO Edward "Ted" Mooney.

Mooney credits quality "culture" with opening channels between IS and top management, sales, marketing and research and enabling a $10 million effort to equip 2,000 Nalco sales representatives worldwide with a laptop-based analytical system.

The approach seems to work: Mooney and David R. Bertran, Nalco's senior vice president of manufacturing, logistics and IS, last year won the prestigious Society for Information Management "Partners In Leadership" award for outstanding teamwork. (JC Penney Co. was a co-winner.)

• **Common ground.** Whether it's technically astute CEOs or IS chiefs with business credits and training, top partnerships require some meeting in the middle.

Kenneth A. Nelson, vice president of MIS at Reader's Digest Association, Inc., rose through the technical ranks at Mars, Inc. and eventually ran a business unit worth "several hundred million."

Since 1991, he has worked alongside Reader's Digest CEO James P. Schadt at the $4.5 billion global publisher. Nelson calls the technology shots on a massive global database of 100 million names — a key strategic asset for the Pleasantville, N.Y., company. "I'm always thinking very much as a business manager," he says.

Similarly, James P. Bradley headed a large health maintenance unit for Aetna Life and Casualty Co. before becoming senior vice president and CIO at United Healthcare Corp. "If you don't know the fundamental drivers, you limit your effectiveness and thus your relationship with the CEO," he says.

On the flip side, it doesn't hurt to have a boss who's not tech-shy. Take American President's Lillie: In the 1960s, he programmed punch cards at Boise Cascade Corp. Today he uses electronic mail and Microsoft Corp.'s Word and likes to tinker with a Macintosh multimedia computer at home.

"An employee once referred to me as a hacker," he says proudly.

• **Good personal fit.** The right resume and culture can get you onto the executive committee. But what if you're a dud?

"With a good personal fit, you could be down a notch or two in the organization and still be effective," Marston says.

But it doesn't hurt to be a bit cheeky. "I can't tell you [CEO William E. Guire] and I don't argue," Bradley admits. "I've always found it easier to ask forgiveness than permission."

And surprise: Tight CEO/CIO teams often seem less concerned with strict return on investment. How technology will advance business goals is often a bigger concern. Gut feel isn't unheard of.

"What got us from $1 billion to $5 billion in annual sales in five years wasn't a bureaucratic capital expenditure committee," Bradley says.

While CEOs and CIOs say drawbacks to tight partnerships are few, they don't ensure perpetual technological bliss. For example, Nalco's initial laptop pilot flopped. Problem: Reps hated the canned software.

In addition, highly-placed IS heads still must gain the respect of other top managers. And that, they say, can be tougher than currying the boss' favor.

"You can be well-positioned in the organization," American President's Marston says. "But if you can't work yourself into the confidence of senior people, you don't have a chance to survive. They can shut you out with the speed of light." □

Maglitta is Computerworld's senior editor, Corporate Strategies.

photograph by WILLIAM MCLEOD

in Person

IS in genes

A hands-off approach helps Amgen CEO Gordon Binder turn molecules into money

BY JOSEPH MAGLITTA

At Amgen, inc., the nation's largest independent hiotechnology company, Macintosh computers outnumber employees: 3,600 vs. 3,000. "Amgen runs on PCs," says Chnirman and Chief Executive Officer Gordon Binder.

Indeed, the Thousand Oaks, Calif., compnny lives or dies on technology. Amgen scientists use molecular hiology and state-of-the-art systems to create highly specialized health care products. Its higgest sellers — an nnemin fighter called Epogen and Neopegen, an anti-infection agent — were crented using sophisticated recombinant DNA techniques.

Since Binder became CEO in 1988, Amgen's annual revenue has shot from $200 million to $1.3 hillion. Net income has tripled. Amgen now boasts offices in North America, Australia, Japan, Europe and Hong Kong.

CW Many of your CEO peers are pretty skeptical about technology hoosting productivity. You, too?

BINDER Ten years ngo, if you walked through one of our lahs, you'd see scientists at benches running experiments. If you walk through one of our labs today, you'll see pieces of scientific equipment hooked to a PC, chugging away, while the scientist is away researching dnta. A lot of this stuff can run all night long. information technology certainly improves productivity for us.

CW How?

BINDER Nobody makes a mistake entering datn, for instance, because statistical analysis programs make the charts. And we hnve over 24 huildings here, so we save a lot of walking between.

CW Most CEOs also swear that technology is pivotal to business. Is that true for Amgen? Why?

BINDER We have thousands of patients in clinical trials; all sorts of data is collected on each one. Each of these pieces of data has to be analyzed and reconciled and reported to the FDA. We couldn't begin to do that without computers.

CW What's your approach to corporate technology use?

BINDER Even before I joined Amgen in 1982 . . . it was clear that the cost of hardware was coming down rapidly and the cost of software was going up. Information technology salaries were also rising. So the idea of picking the hardware first — and in doing so making the more expensive people and software inefficient — struck me as funny.

CW How is thnt philosophy played out at Amgen today?

BINDER From the very beginning, each major area of the company has had the freedom and finances to acquire and run its own hardware and software. We say: "Get what you want and need." The marketing department, for example, can spend more on ads or the sales force or information technology. It's up to them.

CW How does Amgen judge if an IS project is worth the money?

photo illustration by M. A. D

BINDER We have case-by-case guidelines. A lot of [return on investment] calculations are pretty off. How do you measure improved sales force productivity? I find if the salespeople thought it was great and the national sales manager thought it was great, it probably is great.

CW That's a lot of power for business departments. How has it worked out?

BINDER It varies from group to group. If a function head is very information technology-oriented and very aggressive, they will have a very sophisticated information technology setup. The weaker ones need more help.

CW You have a chief information officer and a 70-person corporate IS function. Where do they fit in?

BINDER [CIO Bruce D. Whetstone] installs systems and gets them running but without ownership. Bruce provides [air-conditioning], fiber cable, interoperability and connectivity for remote sites and overseas operations. He also has major training responsibility.

CW How do you see your role in IS? The CIO's?

BINDER We make it easy for people to run the major departments. Our roles are quite often the same: We deal with very basic policy issues, very broad guidelines. It's up to Bruce [Whetstone] to get new tech opportunities to all the people and to pour cold water on fancy new ideas that don't make any business sense. Computer security is a special hot button I get involved in.

CW You're the leading firm in a young industry that has no IS tradition or legendary systems. Does that help or hinder?

BINDER I'm not sure we've gotten any real benefit from the information technology tradition. We tend to be pioneers rather than copiers. We've built our infrastructure from the ground up.

CW How does company culture impact IS?

BINDER We tend to be very science-oriented in everything we do. We think everybody in the company can run experiments, not just people in the labs. Information technology experiments are built into the culture. We're also a company full of relatively young people who are receptive to new things.

photograph by M. A. D.

"If the head of **accounting** came to me and said he **didn't have** the **software** he needed, I'd say **'Why don't you get it?'** End of meeting."

CW Are you a techno-fan, technophobe or something in between?

BINDER I'm really not a technology user. I see things better on pieces of paper, even though some come out of a computer. I look to put notes on these [sheets] in the margins and send them back. Plus, I travel a lot. It doesn't make as much sense for my particular work.

CW You've been in business since 1957. Any areas where computing professionals consistently don't get it?

BINDER I guess my biggest criticism is that some information technology people weren't user-friendly. They tended to have their own agenda more than they should. They're not as service-oriented as they should be.

CW The notion that IS can provide a competitive edge has suffered recently. Do you agree?

BINDER Increased productivity is a competitive advantage. It takes eight to 10 years to get a molecule to market. Every time we knock off another day, we have a better chance of being the first to get a patent to market. That can mean the difference between a lot of sales and no sales. □

Maglitta is Computerworld's senior editor, Corporate Strategies.

remier 100 Survey

feelin' groovy

Budget and user pressures aside, Premier 100 IS departments are a confident group

BY PAUL GILLIN

Premier 100 information systems departments are learning to live under a microscope. Our annual survey of the Premier 100 demonstrates clearly that corporate management is watching IS groups more closely than ever. Increasing demands from the user community, tighter budgets and the need to cost-justify project investments are forcing IS departments to put up or shut up. Fortunately, most believe they're doing a pretty good job of putting up.

"Over the last several years, our back office is probably handling two to three times the volume of trades with 75% of the people," says W. Bee Kuenemann, senior managing director of information services at The Bear Stearns Cos. in Whippany, N.J. "That's got to mean something."

What it means is that *Premier 100* CIOs are confident that the productive value of the IS investment is tangible, but they expect benefits to show up in business results. Just spending money on computers isn't enough. The executives are inclined to experiment more with organizational changes than with technology, moving their people closer to the business units and forcing more decisions out to the end users rather than hard-coding the information flows that already exist. They are also inclined to look at outsourcing as a strategic option rather than as a political threat.

The *Premier 100* companies are also a pretty cost-conscious group, judging by their approach to cost justification. Fully 95% of the respondents said return on investment (ROI) measures are very important or somewhat important to getting a project through the corporate approval cycle.

"We do an ROI on every project," says Patrick Zilvitis, vice president of corporate information technology at Gillette Co. "Our whole [information technology] strategy is to support the business strategy and improve value to shareholders."

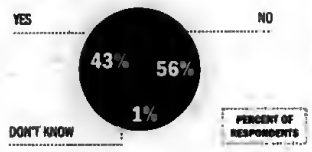
SKY'S THE LIMIT

However, Zilvitis, like other managers, says Gillette is not pinching pennies when it comes to projects with big potential strategic payoffs. Other *Premier 100* executives agree. When we

Reinventing IS

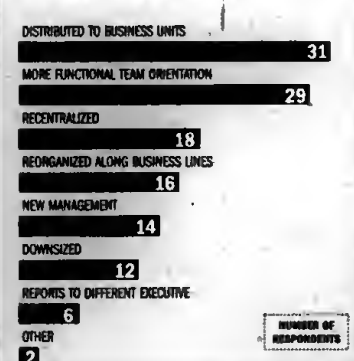
Pressure to perform is pushing groups to realign themselves . . .

Has your IS department been altered to better align with business needs?



. . . but along very different lines

How has the structure of your IS department been altered during the past year?



Source: *Premier 100* survey

asked what management attitudes were toward IS investments, seven out of 10 executives said management is investing, although generally with cost-justification criteria. Only four of the companies said management is in an active cost-reduction mode.

PAYOFF TIME

And they clearly believe the payoff of that investment is emerging. Asked whether spending on IS is enhancing white-collar productivity, 93 of the 99 people who answered the question said yes.

One reason the benefits may be showing up is an intensified focus on revamping business processes through IS instead of just automating what's there.

The survey results indicate that the re-engineering phenomenon is catching fire, with 74% of the respondents saying they had re-engineered or redesigned some business processes in the past year to exploit technology. Sales and marketing functions are the beneficiaries of the bulk of that effort. Fully half the *Premier 100* are involved in some kind of sales and marketing retooling.

That's in line with the new image of IS as a product line developer, according to Thornton May, vice president of research and education at Cambridge Technology Partners in Cambridge, Mass. "Your old-line CIO was basically somebody who managed budgets effectively," he says. "You're now putting in place an entrepreneur who can grow the business."

APPEASING TOP BRASS

The results testify to the importance of satisfying top management. While the majority of the survey respondents said scrutiny of IS by top management and shareholders had not changed during the past year, a sizable minority (40%) said it had increased. Only four of the 100 respondents said the pressure had lessened.

However, increasing scrutiny is a half-empty/half-full proposition.

Some IS managers relish the idea of top management attention because it allows them to show off the value they can add to the business. "Senior management feels strongly that technology is important to move forward," says John Kazik, senior vice president at Tribune Co. in Chicago.

IS groups are also reorganizing themselves, but there's hardly agreement among them on which way to go. Forty-three percent of the groups have undergone some kind of organizational change in the past year to better respond to business needs.

Of those who have rejiggered, nearly a third have been distributed into the business units. However, nearly one in five has actually been recentralized to achieve economies of scale and to cut costs.

The contradiction may reflect the push/pull many IS departments are facing today: Get closer to the users but do more for less money.

Gillette's IS group is one of those that's spreading out to get closer to the customers. Many of the IS staffers now report directly into discrete business units with dotted-line responsibility to a central function, Zilvitis says.

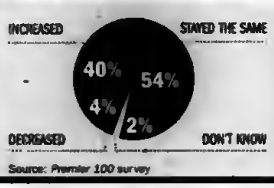
"My staff has diminished considerably, but the function is now spread throughout the company so we all work together," he says. "In these days of self-empowered teams, you no longer can judge your position by how many people directly report to you." □

Gillin is Computerworld*'s editor.*

Best behavior

IS departments are under the microscope

During the past year do you believe that the degree of scrutiny of IS by management and shareholders has increased, decreased or stayed the same?



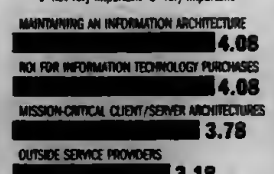
Source: *Premier 100* survey

Planning and execution

Premier 100 executives say no project is executed without a plan

How important are each of the following to your company?

1=not very important 5=very important



performers

In the **IS productivity game,** these players **finish** well **ahead** of their peers

BY KIM S. NASH

Lapping the field

These *Premier 100* companies boast the biggest lead over their industry peers in the Information Productivity Index

	Transportation	Rank
COMPANY	Illinois Central Corp.	2
CLOSEST RIVAL	American President Cos.	44
	Soaps and cosmetics	
COMPANY	International Flavors & Fragrances, Inc.	15
CLOSEST RIVAL	Avon Products, Inc.	98
	Farm equipment	
COMPANY	Briggs & Stratton Corp.	28
CLOSEST RIVAL	Stewart & Stevenson Services	91
	Beverages	
COMPANY	Coca Cola Co.	33
CLOSEST RIVAL	Whitman Corp.	106
	Publishing and printing	
COMPANY	Gannett Co.	37
CLOSEST RIVAL	Tribune Co.	92
	Life insurance	
COMPANY	IDS Financial Corp.	73
CLOSEST RIVAL	None in Top 230 companies	NA

When it comes to those great smells that remind you of a new car, a pine tree or a fun summer at the beach, International Flavors & Fragrances, Inc. (IFF) stands out from its competitors. With more than 80,000 recipes on file, IFF is the world's leader in the synthetic taste and smell market.

The company is also notable for finishing far ahead of its industry brethren in information systems effectiveness using the *Premier 100*'s Information Productivity Index.

Information productivity, used to rank the *Premier 100*, rewards companies that achieve a high level of productivity for low overhead or management cost, or those that do more with less. This year, IFF and five other highfliers finished well ahead of their industry peers in information productivity rankings. The others include publisher Gannett Co., financial firm IDS Financial Corp., transportation company Illinois Central Corp., heavy manufacturer Briggs & Stratton Corp. and Coca Cola Co. The latter two declined interviews, citing state secrets.

Without exception, every IS scheme these companies hatch is predicated on knowing and serving clients better. But they also emphasize tangible bottom-line benefits from IS spending.

Wariness of investing in the unproved is indicated by a rather blase view of client/server at these firms. Briggs & Stratton allocates about 20% of its new software development to client/server, while Illinois Central says it devotes just 10%.

SECRETS OF SUCCESS

Consider some other traits shared by these best of the best in IS.

■ Close to the customer. At IFF and Gannett, IS actually lives at business units. Gannett employs systems managers at each of more than 160 newspaper offices and TV stations nationwide. IFF experimented last year with relocating application developers, business modelers and other technicians to individual user departments.

The move shook people up — for the better, says IS director Wim van Berkel. IS learned what sales, marketing and engineering does and vice versa.

That doesn't mean IFF's 57-member IS staff knows how to bind polymers to create the perfect cheddar flavor for a new cheese-like product. But IS must understand how the salesperson who sells that flavor works and what the clients need to know when, van Berkel says. "We've made it very clear to people that that's their charter."

■ Customer service, customer service, customer service. Like a caffeine addict around

photograph by NEIL SELKIRK

IFF'S WIM VAN BERKEL says IS must understand how salespeople at the company work

fine Brazilian coffee, Carl Beihl, vice president of strategic technology planning at IDS, obsesses about catering to the customer. "Previously, we were organized around products — mutual funds, policies, that kind of thing," he says. "Now we're focused around market groups — who's buying what and how we can help them buy more."

IDS plans to roll out early next year new client management software to its nationwide sales force.

But more important are the regular meetings software developers have with field sales, says Alan Bidnall, IDS' vice president of financial planning. Bidnall and other business managers meet with IS folks each quarter to refine technology projects in progress and in planning.

With 11 years in IS before assuming his current role in 1990, Bidnall says the process is simple. "We look at what our competitors are doing and what we want to do, then IS goes off and figures out the technology to make it happen."

Sometimes the two sides disagree on how to reach goals, "but the clash is part of the coming together," Bidnall adds.

At some firms, electronic data interchange is becoming synonymous with customer service, says IFF's van Berkel. IFF is considering setting up terminals at customer sites next year, and Milwaukee-based engine and lock maker Briggs & Stratton may also link to suppliers in that manner.

■ Outsourcing is not a dirty word anymore. While it used to be a scary, expensive, all-or-nothing deal, outsourcing has been whittled down to a tool that can be controlled by IS. Such selective outsourcing can be like a surgeon's knife, says Geoffrey Barnes, a consultant at Cap Gemini America, Inc.'s Atlanta office. Applied thoughtfully and precisely, outsourcing is a way to "cut away the painful parts of your job to promote growth," he says.

Illinois Central recently farmed out its core transportation systems to the Union Pacific Technology unit of Union Pacific Railroad. Illinois Central plans to redeploy internal IS to rebuild and "client/server-ize" financial systems, says Norman Schwarz, director of technical network support.

■ ROI is king. One issue that unifies the *Premier 100* star performers is a focus on cost justification. Asked on the *Premier 100* survey to rate the importance of return on investment (ROI) in justifying IS investments, nearly every company deemed it "extremely important."

ROI "is the only way we go," IDS' Bidnall says. But the firm allows strategic projects more breathing room as far as showing bottom-line returns, he says. However, quick hit efforts, such as setting up a temporary forecasting system, need to prove their value almost immediately, he says.

Likewise, each and every project at Gannett is looked at first for its ROI, says John Palm, IS director at the Arlington, Va.-based company. Gannett recently installed a graphical decision support application to help advertising marketers better target their efforts. Palm wouldn't specify how much money the media chain has seen in new sales related to the application, but he says the project will continue: "We're putting a lot more money into it next year, let's just say." □

Nash is a Computerworld West Coast senior editor.

IT'S NICE TO KNOW HE'S IN GOOD COMPANY.

THIS MIS MANAGER JUST MADE THE BIGGEST DECISION OF HIS CAREER.

A radical redesign of your enterprise information system was a tough decision. But every now and then you're presented with an easy choice. Whether you're building networked applications from scratch or simply offloading your database from the mainframe, Sun offers the best UNIX® platform for RDBMS. More relational database software, including ORACLE, INFORMIX, Sybase, and Ingres, is sold on Sun® systems than on any other UNIX platform. Our servers allow you to interoperate with your existing mainframe and PCs, and expand incrementally as your organization grows. Call 1 800-786-0785, ext. 105 for a copy of IDC's white paper, "Sun Servers in the Enterprise." You'll see why more people choose Sun to make the tough decisions easier.

Sun

The Network Is The Computer.™

© 1994 Sun Microsystems, Inc

COMPUTERWORLD's Code of Ethics

1. Computerworld's first priority is the interest of its readers.
2. Editorial decisions are made free of advertisers' influence.
3. We insist on fair, unbiased presentation in all news and articles.
4. No advertising that simulates editorial content will be published.
5. Plagiarism is grounds for dismissal.
6. Computerworld makes prompt, complete corrections of errors.
7. Journalists do not own or trade in computer industry stocks.
8. No secondary employment in the IS industry is permitted.
9. Our commitment to fairness is our defense against slander.
10. All editorial opinions will be clearly labeled as such.

COMPUTERWORLD

Future desktop decisions loom

User complaints eclipse Sun planets

Oracle untangles pricing knot

IBM services hitting the mark

WORDS WE LIVE BY.

When you pick up a copy of *Computerworld,* you know you're getting the most objective, unbiased news and information in IS. Our code of ethics guarantees it.

Why do we make such a big deal out of editorial integrity?

Because the words you read in *Computerworld* often have a dramatic impact on your business, your career, and your future.

You use this information to evaluate new products. To get a candid view of emerging technologies. To find out the inside story on corporate strategies. To decide whether to jump ship or stay in your current job. To get the edge on your competition.

In short, *Computerworld* is filled with the words IS professionals like you live by.

WORDS YOU WORK BY.

Week in and week out, our editors and reporters call it the way they see it – on issues ranging from network management to reengineering. They dig deeply to bring you the most accurate, comprehensive news in IS.

It's no wonder over 140,000 IS professionals pay to subscribe to *Computerworld* every week. Shouldn't you? Order today and you'll receive 51 information-packed issues. Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the leading companies using IS technology.

Call us toll-free at **1-800-343-6474**. Or use the postage-paid subscription card bound into this issue.

You'll get the kind of straightforward, impartial reporting you can work by. You have our word on it.

COMPUTERWORLD

SAVE OVER $8

COMPUTERWORLD

Professional Courtesy Discount

51 Issues for $~~48~~. *Now only $39.95*

YES, I want to receive my own copy of COMPUTERWORLD. I accept your offer of $39.95* for 51 weekly issues. That's a savings of over $8.00 off the basic rate.

Address is: ❑ Home ❑ Business Basic rate: $4/l per year. *U.S. only

Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Name

Title

Company

Address

City State Zip

Recycled Paper

Please complete the information below to qualify for this special offer

1. BUSINESS/INDUSTRY (Circle one)
   - 10 Manufacturer (other than computer)
   - 20 Finance/Insurance/Real Estate
   - 30 Medical/Law/Education
   - 40 Wholesale/Retail/Trade
   - 50 Business Service (except DP)
   - 60 Government State/Federal/Local
   - 65 Communications Systems/Public Utilities/Transportation
   - 70 Mining/Construction/Petroleum/Refining/Agriculture
   - 80 Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90 Computer/Peripheral Dealer/Dist./Retailer
   - 95 Other _____ (Please Specify)
2. TITLE/FUNCTION (Circle one)

   IS/MIS/DP MANAGEMENT
   - 10 Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   - 21 Dir./Mgr. MIS Services, Information Center
   - 22 Dir./Mgr. Network Sys. Data/Tele Comm., LAN Mgr. /PC Mgr. Tech Planning, Admin Services
   - 23 Dir./Mgr. Sys. Development, Systems Architecture
   - 31 Programming Management, Software Developers
   - 41 Engineering, Scientific, R&D, Tech. Mgt.
   - 60 Sys. Integrators/VARs/Computing Mgt.

   CORPORATE MANAGEMENT
   - 11 President, Owner/Partner General Manager
   - 12 Vice President, Asst. VP
   - 13 Treasurer Controller Financial Officer

   DEPARTMENTAL MANAGEMENT
   - 51 Sales & Mktg. Management
   - 70 Medical, Legal, Accounting Mgt.

   OTHER PROFESSIONAL MANAGEMENT
   - 80 Information Centers/Libraries, Educators, Journalists, Students
   - 90 Other Titled Personnel
3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

   Operating Systems
   - (a) Solaris (e) Mac OS
   - (b) Netware (f) Windows NT
   - (c) OS/2 (g) Windows
   - (d) Unix (h) NeXTstep

   App. Development Products
   - ❑ Yes ❑ No

   Networking Products
   - ❑ Yes ❑ No

E4PJ4-X

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, ON 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
PO BOX 2044
MARION OHIO 43306-2144

Comment

How we evaluated productivity

PAUL STRASSMANN

Twenty years of experience as a CIO trying to explain budget increases to corporate executives has taught me that our traditional means of evaluating productivity don't work. In this issue, you'll find criteria that do.

This year's listing of *Computerworld Premier 100* companies was compiled based on my own Information Productivity Index.

Information Productivity measures and rewards the effectiveness of corporate management. It does not reward the more common metrics of information technology spending, such as computer budget, the value of installed equipment or other measures of brute force. That is because there is no demonstrable correlation between the financial performance of a firm and the amount it spends on information technologies. What matters is not how much you spend but how well you spend it in supporting business missions and contributing to productivity.

The old justification methods don't work because they rely on ratios that measure the efficiency of capital. These indicators have such names as return on assets, return on investment and return on equity. But in modern enterprises, capital doesn't mean as much as it used to. The performance of high technology and service businesses are influenced more by the quality of their management than by their assets.

Productivity is the ratio of output to input. Unfortunately, there's no place for management's output on an income statement. But there is a way to calculate it. If you subtract from after-tax profits the value of the shareholder's equity capital, what's left is the value of management.

Technology isn't productive in itself. But well-managed, superbly trained and motivated people — with or without computers — can show measurable gains in output.

Input of management is the cost of the coordination of an enterprise, frequently defined as either overhead or indirect costs.

These definitions of output and input reject conventional productivity measures. For example, revenue is not a measure of output because it includes value added by suppliers. Profits are not an acceptable measure of performance because they don't include compensation to shareholders. Costs — especially costs per employee — are misleading indicators of input because they include the value of purchases. The value of assets is irrelevant as a measure of input because leasing and outsourcing distort that statistic.

Recent improvements in financial reporting and the availability of detailed financial information have made it possible to calculate a reasonable return on management. For output, I use Stern, Stewart & Co.'s popular Economic Value-Added (EVA). If EVA is not available, output can be calculated by subtracting from operating profit after taxes the value of shareholder equity, multiplied by the cost of capital.

The costs of sales, general and administration (SG&A) are a reasonable approximation of management costs. Divide EVA by SG&A to get the Information Productivity Index.

The *Computerworld Premier 100* rankings have been calculated using published 1993 financial results for the Fortune 1,000. Because some firms show wide swings in year-to-year profits, our rankings also considered three-year averages. Firms that reported favorable operating profits after taxes but also large accounting write-offs, which made their shareholder equity negative, were eliminated from consideration.

Because Information Productivity relates to the numbers that are watched and understood by your board of directors, your top executives and your shareholders, this year's *Computerworld Premier 100* rankings offer a sound basis from which to start discussions on how to do better next year. □

Strassmann is a consultant and former CIO of Kraft Corp., General Foods Corp., Xerox Corp. and the U.S. Department of Defense.

Premier 100

PREMIER 100 RANK	COMPANY	INDUSTRY	INFORMATION PRODUCTIVITY INDEX	CIO'S YEARS IN POSITION	CIO REPORTS TO
1	**Uniffi, Inc.**	Textiles	1.81	12	Executive Vice President, Finance
2	**Illinois Central Corp.**	Transportation	1.35	4	President & CEO
3	**Ambac, Inc.***	Financial Services	1.25	1	CEO
4	**ARA Group, Inc.**	Diversified Services	1.08	12	Senior Vice President, Finance & HR
5	**UST, Inc.***	Tobacco	1.05	NA	NA
6	**Fluor Corp.**	Diversified Services	.95	3	Group President
7	**MAPCO, Inc.**	Petroleum Refining	.82	1	Senior Vice President & CFO
8	**MBIA, Inc.**	Financial Services	.78	1	Controller & Senior Vice President
9	**U.S. Healthcare, Inc.**	Diversified Services	.74	5	Chief Marketing Officer & COO
10	**Amgen, Inc.**	Pharmaceuticals	.71	4.5	Senior Vice President, Operations
11	**Newmont Mining Corp.**	Gold Mining	.6	2.5	Senior Vice President, Operations
12	**Cooper Tire & Rubber Co.**	Plastic Products	.58	2	President & COO
13	**Great Lakes Chemical Corp.**	Chemicals	.52	8	Executive Vice President & CFO
14	**Abbott Laboratories***	Pharmaceuticals	.5	NA	NA
15	**International Flavors & Fragrances, Inc.**	Soaps & Cosmetics	.49	18	President
16	**The Bear Stearns Cos.**	Financial Services	.43	7	COO & CFO
17	**Walt Disney Co.**	Diversified Services	.41	5	CFO
18	**CSF Holdings, Inc.***	Savings Banks	.41	8	Vice President, Finance
19	**Ace Hardware Corp.**	Diversified Services	.4	5	Executive Vice President & COO
20	**Waste Management, Inc.**	Diversified Services	.38	0.25	CFO
21	**Collective Bancorp, Inc.**	Savings Banks	.37	3	Vice Chairman
22	**Schering-Plough Corp.***	Pharmaceuticals	.36	6	Executive Vice President
23	**Fruit of the Loom, Inc.***	Apparel	.36	NA	NA
24	**Morgan Stanley Group, Inc.***	Financial Services	.35	1	Senior Vice President
25	**American Home Products Corp.**	Pharmaceuticals	.34	3	Executive Vice President

***Data not from the top executive at the company**

Note: Information Productivity Index=[(Profit before taxes-provision for income taxes)-cost of capital]
[Selling, general & administrative expense] Higher numbers indicate superior productivity

TOTAL NUMBER OF EMPLOYEES	TOTAL NUMBER OF IS STAFF (RANGE)	TOTAL IS BUDGET (RANGE)	PERCENT CHANGE IN BUDGET '93-'94	PERCENT IS BUDGET SPENT OUTSIDE IS DEPARTMENT	PERCENT SOFTWARE SPENT ON NEW DEVELOPMENT	PERCENT SOFTWARE DEVELOPMENT FOR CLIENT/SERVER	PERCENT SOFTWARE DEVELOPMENT FOR MAINTENANCE	TOTAL DESKTOP SERVERS (RANGE)	PERCENT OF DESKTOP DEVICES NETWORKED
5,177	<100	$5M-$9.9M	22%	15%	65%	28%	NA	250-499	19%
3,219	<100	$5M-$9.9M	-0.6%	5%	16%	11%	84%	500-999	21%
300	<100	$25M-$49.9M	NA	NA	NA	NA	NA	1,000-2,499	NA
135,400	250-499	$25M-$49.9M	2.5%	15%	60%	40%	40%	>10,000	15%
3,724	100-249	$25M-$49.9M	NA	NA	NA	NA	40%	1,000-2,499	NA
43,000	500-999	$100M-$249.9M	0%	5%	30%	10%	70%	1,000-2,499	95%
6,313	<100	$10M-$24.9M	NA	20%	40%	10%	60%	1,000-2,499	70%
350	<100	$1M-$4.9M	17.5%	NA	90%	33%	10%	250-499	100%
3,800	250-499	$50M-$99.9M	18%	65%	65%	80%	35%	2,500-4,999	95%
3,807	100-249	$25M-$49.9M	NA	12%	60%	15%	40%	2,500-4,999	95%
2,393	<100	$1M-$4.9M	13%	2%	30%	25%	70%	500-999	90%
7,500	100-249	$10M-$24.9M	7%	10%	60%	25%	40%	1,000-2,499	75%
7,000	100-249	$10M-$24.9M	0%	10%	35%	10%	65%	1,000-2,499	75%
49,659	1,000-2,499	$250M-$499.9M	10%	NA	NA	NA	NA	5,000-9,999	NA
4,300	100-249	$25M-$49.9M	-3%	17%	90%	85%	10%	1,000-2,499	100%
7,321	500-999	$100M-$249.9M	23%	6%	57%	43%	43%	>10,000	97%
62,000	1,000-2,499	$250M-$499.9M	1%	5%	65%	35%	35%	>10,000	95%
620	<100	$25M-$49.9M	0%	50%	75%	70%	25%	1,000-2,499	30%
3,718	100-249	$10M-$24.9M	9%	0%	60%	10%	40%	1,000-2,499	80%
35,979	250-499	$50M-$99.9M	-26%	50%	20%	1%	80%	>10,000	78%
1,050	<100	$1M-$4.9M	0%	0%	10%	100%	90%	1,000-2,499	90%
21,600	500-999	$50M-$99.9M	5%	10%	55%	75%	45%	2,500-4,999	75%
35,000	<100	$50M-$99.9M	NA	NA	NA	NA	NA	1,000-2,499	NA
9,025	<100	$1M-$4.9M	-20%	10%	75%	50%	25%	1,000-2,499	100%
50,000	1,000-2,499	$100M-$249.9M	10%	10%	10%	80%	80%	2,500-4,999	65%

Illustrations by M A D

Premier 100

PREMIER 100 RANK	COMPANY	INDUSTRY	INFORMATION PRODUCTIVITY INDEX	CIO'S YEARS IN POSITION	CIO REPORTS TO
26	**Cone Mills Corp.***	Textiles	.33	3	Vice President, Finance
27	**Merck & Co.**	Pharmaceuticals	.33	2	Senior Vice President
28	**Briggs & Stratton Corp.**	Farm Equipment	.33	19	Executive Vice President, Administration
29	**Merrill Lynch & Co.**	Financial Services	.32	3.5	Chairman & CEO
30	**Boston BancCorp***	Savings Banks	.32	1	CEO
31	**Sunbeam-Oster Co.***	Electronics	3	0	CFO
32	**Salomon Brothers, Inc.**	Financial Services	.29	3	Managing Director of Exec. Committee
33	**Coca Cola Co.***	Beverages	.29	3	Controller
34	**Bristol-Myers Squibb Co.***	Pharmaceuticals	.29	3	CFO
35	**Praxair, Inc.**	Chemicals	.29	0.5	CFO
36	**Charles Schwab Corp.**	Financial Services	.29	1	President
37	**Gannett Co.***	Publishing & Printing	.28	12	CFO
38	**GEICO Corp.**	Financial Services	.26	1	CEO
39	**Levi Strauss Associates, Inc.**	Apparel	.25	9	COO
40	**Dibrell Brothers, Inc.**	Tobacco	.24	25	Senior Vice President & CFO
41	**Gerber Products Co.**	Food	.24	10	CFO
42	**Rubbermaid, Inc.***	Plastic Products	.24	NA	NA
43	**Medtronic, Inc.**	Photographic Equipment	.23	15	Senior Vice President & CFO
44	**American President Cos.**	Transportation	.23	7	Chairman, CEO & President
45	**H&R Block, Inc.**	Diversified Services	.22	1	President & CEO
46	**Raytheon Co.***	Electronics	.22	3	Vice President, Engineering
47	**Kellogg Co.***	Food	.21	12	Vice President
48	**Worthington Industries, Inc.**	Metals	.21	1	Vice President, Engineering
49	**United Healthcare Corp.**	Diversified Services	.21	5	CEO
50	**W. M. Wrigley Jr. Co.***	Food	.2	2	Vice President, Finance

***Data not from the top executive at the company**

TOTAL NUMBER OF EMPLOYEES	TOTAL NUMBER OF IS STAFF (RANGE)	TOTAL IS BUDGET (RANGE)	PERCENT CHANGE IN BUDGET '93-'94	PERCENT IS BUDGET SPENT OUTSIDE IS DEPARTMENT	PERCENT SOFTWARE SPENT ON NEW DEVELOPMENT	PERCENT SOFTWARE DEVELOPMENT FOR CLIENT/SERVER	PERCENT SOFTWARE DEVELOPMENT FOR MAINTENANCE	TOTAL DESKTOP SERVERS (RANGE)	PERCENT OF DESKTOP DEVICES NETWORKED
7,800	250-499	$25M-$49.9M	0%	1%	40%	5%	60%	2,500-4,999	90%
18,172	500-999	$100M-$249.9M	9%	10%	65%	80%	35%	1,000-2,499	80%
7,950	<100	$5M-$9.9M	4%	20%	25%	20%	75%	500-999	40%
42,650	2,500-4,999	>$500M	7%	0%	60%	70%	40%	2,500-4,999	90%
210	<100	$1M-$4.9M	NA	20%	0%	99%	100%	100-249	100%
10,500	500-999	$1M-$4.9M	80%	0%	40%	95%	60%	1,000-2,499	100%
8,629	1,000-2,499	$100M-$249.9M	-2%	50%	35%	100%	65%	5,000-9,999	99%
34,000	100-249	$100M-$249.9M	0%	25%	60%	50%	40%	5,000-9,999	50%
49,500	1,000-2,499	$100M-$249.9M	-10%	5%	40%	30%	60%	>10,000	70%
16,766	100-249	$10M-$24.9M	-20%	25%	50%	75%	60%	2,500-4,999	95%
6,100	500-999	$100M-$249.9M	12%	25%	80%	85%	20%	5,000-9,999	90%
36,000	500-999	$50M-$99.9M	5%	0%	40%	20%	60%	>10,000	30%
8,350	500-999	$25M-$49.9M	4%	12.5%	58%	15%	42%	5,000-9,999	98%
36,400	500-999	$50M-$99.9M	78%	NA	90%	50%	10%	5,000-9,999	100%
4,600	<100	$1M-$4.9M	-10%	12%	60%	80%	40%	100-249	25%
9,280	100-249	$10M-$24.9M	11%	30%	80%	30%	NA	1,000-2,499	50%
11,978	100-249	$50M-$99.9M	3%	NA	NA	NA	NA	2,500-4,999	NA
9,856	100-249	$25M-$49.9M	8%	NA	65%	25%	35%	2,500-4,999	90%
4,655	250-499	$100M-$249.9M	13%	37%	60%	90%	40%	2,500-4,999	80%
81,000	250-499	$10M-$24.9M	15%	75%	60%	5%	40%	>10,000	2%
63,800	>10,000	$25M-$49.9M	7%	30%	30%	70%	70%	>10,000	85%
16,151	500-999	$250M-$499.9M	7%	15%	30%	15%	70%	>10,000	35%
7,000	<100	$5M-$9.9M	50%	60%	20%	0%	80%	1,000-2,499	80%
7,772	500-999	$100M-$249.9M	22%	NA	40%	30%	60%	5,000-9,999	98%
6,700	100-249	$10M-$24.9M	10%	20%	50%	10%	50%	500-999	50%

Premier 100

PREMIER 100 RANK	COMPANY	INDUSTRY	INFORMATION PRODUCTIVITY INDEX	CIO'S YEARS IN POSITION	CIO REPORTS TO
51	**Johnson & Johnson***	Pharmaceuticals	.19	4	Chairman & CEO
52	**Newell Co.***	Metal Products	.19	1	Treasurer
53	**NALCO Chemical Co.**	Chemicals	.19	3.5	Senior Vice President, Mfg. & Logistics
54	**Lancaster Colony Corp.***	Food	.19	4	Vice President, Finance
55	**E-Systems, Inc.***	Electronics	.19	6	Vice President, Finance
56	**Nike, Inc.***	Diversified Services	.19	0	Vice President, Operations
57	**Advanta Corp.**	Financial Services	.18	0.5	Senior Vice President, Corporate Admin.
58	**Southwestern Bell Corp.**	Utilities	.18	2.5	President, Network Services
59	**Travelers Corp.**	Financial Services	.18	4	Chief Administration Officer
60	**Charter One Financial, Inc.***	Savings Banks	.18	4	Senior Vice President, Operations
61	**Gap, Inc.**	Retailing	.17	4.5	CFO
62	**Valspar Corp.***	Chemicals	.17	1	President
63	**Bankers Trust New York Corp.**	Commercial Banks	.16	10	President
64	**McDonald's Corp.**	Retailing	.16	11	Executive Vice President
65	**Reebok International Ltd.**	Diversified Services	.16	3	Executive Vice President, Operations
66	**First Commerce Corp.***	Commercial Banks	.16	3	Executive Vice President
67	**Sigma Aldrich Co.***	Chemicals	.16	15	President
68	**Thiokol Corp.**	Aerospace	.16	3.5	Senior Vice President, Finance & CFO
69	**JP Morgan & Co.***	Commercial Banks	.15	3	Managing Director
70	**Rockwell International Corp.**	Electronics	.15	11	Senior Vice President
71	**Emerson Electric Co.**	Electronics	.15	2	Executive Vice President
72	**CPC International, Inc.***	Food	.15	12	Vice President, Administration
73	**IDS Financial Corp.***	Life Insurance	.15	26	CEO
74	**H. J. Heinz Co.***	Food	.15	2	Vice President, Finance
75	**3M Co.**	Photographic Equipment	.15	2	Vice President, Logistics

***Data not from the top executive at the company**

TOTAL NUMBER OF EMPLOYEES	TOTAL NUMBER OF IS STAFF (RANGE)	TOTAL IS BUDGET (RANGE)	PERCENT CHANGE IN BUDGET '93-'94	PERCENT IS BUDGET SPENT OUTSIDE IS DEPARTMENT	PERCENT SOFTWARE SPENT ON NEW DEVELOPMENT	PERCENT SOFTWARE DEVELOPMENT FOR CLIENT/SERVER	PERCENT SOFTWARE DEVELOPMENT FOR MAINTENANCE	TOTAL DESKTOP SERVERS (RANGE)	PERCENT OF DESKTOP DEVICES NETWORKED
81,600	1,000-2,499	$100M-$249.9M	-10%	NA	40%	75%	60%	>10,000	100%
15,000	<100	$10M-$24.9M	3%	10%	30%	5%	70%	1,000-2,499	40%
6,998	100-249	$10M-$24.9M	2%	23%	75%	25%	25%	2,500-4,999	95%
5,000	<100	$1M-$4.9M	5%	10%	50%	5%	50%	100-249	10%
16,703	<100	$50M-$99.9M	5%	50%	100%	5%	0%	5,000-9,999	75%
5,000	250-499	$10M-$24.9M	0%	20%	80%	40%	20%	5,000-9,999	100%
1,600	100-249	$5M-$9.9M	29%	63%	50%	10%	50%	1,000-2,499	100%
61,230	1,000-2,499	$250M-$499.9M	10%	1.5%	20%	70%	60%	>10,000	90%
60,000	2,500-4,999	>$500M	50%	40%	NA	NA	NA	>10,000	85%
1,600	<100	$10M-$24.9M	NA	NA	NA	NA	NA	1,000-2,499	NA
40,000	250-499	$50M-$99.9M	20%	0%	65%	8%	15%	2,500-4,999	92%
2,513	<100	$25M-$49.9M	-15%	5%	5%	50%	95%	500-999	50%
13,000	1,000-2,499	>$500M	18%	0%	65%	80%	20%	>10,000	85%
167,000	500-999	$50M-$99.9M	-1%	20%	75%	20%	25%	1,000-2,499	100%
4,300	250-499	$50M-$99.9M	18%	2.5%	85%	70%	35%	1,000-2,499	100%
3,500	<100	$25M-$49.9M	0%	NA	50%	25%	50%	1,000-2,499	90%
4,291	<100	$10M-$24.9M	22%	NA	NA	25%	NA	1,000-2,499	5%
8,982	250-499	$25M-$49.9M	-6%	5%	86%	60%	14%	>10,000	98%
15,000	250-499	$100M-$249.9M	20%	20%	70%	30%	30%	1,000-2,499	100%
75,000	1,000-2,499	$250M-$499.9M	-2%	25%	50%	15%	50%	>10,000	85%
71,600	500-999	$100M-$249.9M	0%	NA	NA	NA	NA	>10,000	NA
38,924	250-499	$100M-$249.9M	4%	NA	40%	40%	60%	5,000-9,999	50%
8,371	500-999	$100M-$249.9M	15%	20%	60%	30%	40%	>10,000	40%
37,700	500-999	$100M-$249.9M	15%	20%	60%	30%	40%	>10,000	40%
85,650	2,500-4,999	$250M-$499.9M	2%	50%	82%	75%	18%	5,000-9,999	95%

Premier 100

PREMIER 100 RANK	COMPANY	INDUSTRY	INFORMATION PRODUCTIVITY INDEX	CIO'S YEARS IN POSITION	CIO REPORTS TO
76	**Fifth Third Bancorp***	Commercial Banks	.15	0.3	CEO
77	**Ameritech Corp.**	Utilities	.15	1.3	President, Network Services
78	**Rhone Poulenc Rorer, Inc.***	Pharmaceuticals	.14	5	CFO
79	**General Mills, Inc.***	Food	.14	5	Corporate Comtroller
80	**PaineWebber Group, Inc.**	Financial Services	.14	5	Chief Administration Officer
81	**Tyrone Corp.**	Diversified Services	.14	1	Senior Vice President, Board of Dir.
82	**Hon Industries, Inc.***	Furniture	.14	15	President
83	**MBNA Corp.**	Commercial Banks	.14	3	Chairman of the Board & CEO
84	**General RE Corp.***	Financial Services	.14	17	President
85	**First Virginia Banks, Inc.**	Commercial Banks	.13	8	Chairman & CEO
86	**Allergan, Inc.***	Pharmaceuticals	.13	12	CIO
87	**Leggett & Platt, Inc.**	Furniture	.13	20	Senior Vice President, Finance & Admin.
88	**May Department Stores Co.***	Retailing	.13	12	President
89	**Hershey Foods Corp.**	Food	.12	15	Vice President, Finance & Administration
90	**Hillenbrand Industries, Inc.**	Metal Products	.12	5	Vice President & Controller
91	**Stewart & Stevenson Services***	Farm Equipment	.12	21	Corporate Comtroller
92	**Tribune Co.**	Publishing & Printing	.12	5	Chairman & CEO
93	**Reader's Digest Association, Inc.**	Publishing & Printing	.12	3	COO/CEO
94	**Wal-Mart Stores, Inc.**	Retailing	.12	1	COO
95	**Sonoco Products Co.**	Forest Products	.11	4	Executive Vice President
96	**Gillette Co.**	Metal Products	.11	1.5	CFO
97	**Werner Enterprises, Inc.**	Transportation	.11	1	Vice President
98	**Avon Products, Inc.***	Soaps & Cosmetics	.11	7	COO
99	**Dover Corp.***	Farm Equipment	.11	14	Vice President, Finance
100	**Upjohn Co.**	Pharmaceuticals	.11	8	Corp. Executive Vice President, Admin.

***Data not from the top executive at the company**

TOTAL NUMBER OF EMPLOYEES	TOTAL NUMBER OF IS STAFF (RANGE)	TOTAL IS BUDGET (RANGE)	PERCENT CHANGE IN BUDGET '93-'94	PERCENT IS BUDGET SPENT OUTSIDE IS DEPARTMENT	PERCENT SOFTWARE SPENT ON NEW DEVELOPMENT	PERCENT SOFTWARE DEVELOPMENT FOR CLIENT/SERVER	PERCENT SOFTWARE DEVELOPMENT FOR MAINTENANCE	TOTAL DESKTOP SERVERS (RANGE)	PERCENT OF DESKTOP DEVICES NETWORKED
4,938	250-499	$5M-$9.9M	15%	NA	NA	NA	NA	2,500-4,999	NA
66,956	2,500-4,999	>$500M	0%	2%	30%	18%	70%	>10,000	90%
22,500	250-499	$10M-$24.9M	0%	5%	35%	30%	65%	250-499	95%
121,290	250-499	$ 5M-$999,999	10%	NA	NA	NA	NA	2,500-4,999	NA
13,000	500-999	$100M-$249.9M	12%	15%	75%	80%	25%	>10,000	92%
2,445	<100	$1M-$4.9M	-17%	50%	40%	NA	60%	1,000-2,499	80%
5,691	100-249	$10M-$24.9M	10%	0%	20%	10%	80%	1,000-2,499	100%
9,868	1,000-2,499	$50M-$99.9M	87%	19%	61%	15%	39%	5,000-9,999	85%
2,400	250-499	$25M-$49.9M	0%	0%	85%	100%	15%	1,000-2,499	20%
5,400	100-249	$25M-$49.9M	8%	0%	35%	5%	65%	<100	100%
4,749	100-249	$10M-$24.9M	NA	40%	70%	60%	40%	1,000-2,499	80%
4,000	<100	$5M-$9.9M	8%	10%	60%	10%	40%	500-999	2%
140,000	500-999	$50M-$99.9M	0%	10%	40%	5%	60%	>10,000	25%
15,300	100-249	$10M-$24.9M	15%	36%	60%	5%	40%	1,000-2,499	90%
10,200	100-249	>$500M	5%	5%	NA	20%	100%	100-249	100%
2,850	<100	$1M-$4.9M	20%	0%	NA	1%	NA	NA	NA
9,862	<100	$10M-$24.9M	1%	5%	25%	20%	25%	5,000-9,999	25%
7,200	250-499	$50M-$99.9M	0%	1%	64%	34%	36%	5,000-9,999	98%
540,000	1,000-2,499	$250M-$499.9M	15%	1%	85%	95%	15%	>10,000	100%
18,000	<100	$10M-$24.9M	2%	18%	70%	35%	30%	1,000-2,499	70%
33,400	250-499	$100M-$249.9M	13%	20%	70%	80%	30%	>10,000	35%
3,845	<100	$5M-$9.9M	50%	25%	75%	10%	25%	100-249	75%
29,800	500-999	$50M-$99.9M	8%	75%	75%	10%	25%	5,000-9,999	25%
20,445	<10	$5M-$9.9M	5%	20%	50%	85%	50%	250-499	80%
18,600	500-999	$100M-$249.9M	-5%	50%	66%	40%	34%	5,000-9,999	90%

A list of **PREMIER 100** companies, top IS executives and page references. Page numbers refer to the first page of the article(s) in which the company is mentioned.

The 1994 Premier 100

3M Co., David P. Drew, V.P., IT, **50**
Abbott Laboratories, Kenneth Farmer, V.P., Corporate MIS, **48**
Ace Hardware Corp., Don Schuman, V.P., IS, **10,46**
Advanta Corp., Dan Muecke, V.P., Corporate Tech., **50**
Allergan, Inc., Mike Lach, V.P., Info. Svcs., **52**
Ambac, Inc., Randy Schmidt, Sr. V.P., **17,46**
American Home Products Corp., Edward A. Schefer, V.P., MIS, **48**
American President Cos., James S. Marston, Sr. V.P. and CIO, **34,46**
Ameritech Corp., James Goetz, V.P., IT, **52**
Amgen, Inc., Bruce Whetstone, Director, Corporate IT, **8,17,20,36,46**
ARA Group, Inc., John Kallelis, V.P., IT, **17,46**
Avon Products, Inc., 52
Bankers Trust New York Corp., Carmine Vona, Mg. Director, **8,50**
The Bear Stearns Cos., W. Ben Kuenemann, Sr. Mg. Director, Info. Svcs., **8,10,26,38,48**
Boston BanCorp, Kenneth Bordewieck, Director, MIS, **48**
Briggs & Stratton Corp., Larry Salsbury, Director, IS, **40,48**
Bristol-Myers Squibb Co., Alex J. Gibbons, V.P., **48**
Charles Schwab Corp., Dawn LePore, CIO and Exec. V.P., **48**
Charter One Financial, Inc., Marc Reider, Projects Assistant, **50**
Coca Cola Co., Hugh Switzer, V.P. and Director, Info. Svcs., **40,48**
Collective Bancorp, Inc., Eric Gaupp, V.P., Systems, **48**
Cone Mills Corp., Paul Vetter, Director, Info. Svcs., **48**
Cooper Tire & Rubber Co., John E. Mitchell, Director, IS, **10,46**
CPC International, Inc., Angelo Abdela, V.P. and Treasurer, **50**
CSF Holdings, Inc., Jack Butler, Sr. V.P., MIS, **48**
Dibrell Brothers, Inc., Lewis R. Handy, V.P. and Director, MIS, **48**
Dover Corp., 52
E-Systems, Inc., Gary Sprehe, V.P., Federal IS, **50**
Emerson Electric Co., S. Lamar Rieves, V.P., IS, **50**
Fifth Third Bancorp, James Hudepohl, Sr. V.P., MIS, **52**
First Commerce Corp., James Granier, Sr. V.P., IS, **50**
First Virginia Banks, Inc., Shirley C. Beavers Jr., President, **52**
Fluor Corp., Bill Mazilly, V.P., Info. Mgmt., **17,48**
Fruit of the Loom, Inc., Joanne Suczynski, Sr. Mgr., MIS, **48**
Gannett Co., John Palm, V.P., Systems, **40,46**
Gap, Inc., Dennis M. Connors, CIO, **50**
GEICO Corp., Simone J. Pace, CIO and Sr. V.P., **48**
General Mills, Inc., Phil Semmer, CIO, **52**
General RE Corp., Stephen Raye, CIO, **52**
Gerber Products Co., John Kraley, Director, Corporate MIS, **48**
Gillette Co., Patrick Zilvitis, V.P., Corporate IT, **8,38,52**
Great Lakes Chemical Corp., Glenn Scuteri, Director, Info. Svcs., **48**
H&R Block, Inc., Judy Keisling, V.P., Info. Svcs., **48**
H. J. Heinz Co., Jerry Havemann, General Mgr., IS, **50**
Hershey Foods Corp., Bruce Dieffenbach, Director, Info. Svcs., **20,52**
Hillenbrand Industries, Inc., Colin Goodnight, Mgr., Corporate MIS, **52**
Hon Industries, Inc., Jim Goughenour, V.P., Process Improvement and Technology, **52**
IDS Financial Corp., Jack Thomas, Sr. V.P., Info. & Tech., **40,50**
Illinois Central Corp., Dale W. Phillips, V.P. and CFO, **17,40,46**
International Flavors & Fragrances, Inc., Wim Van Berkel, V.P., IT, **40,46**
Johnson & Johnson, Ronald Morris, V.P., IT, **50**
JP Morgan & Co., James Brennan, V.P., Software Development, **50**
Kellogg Co., Jay W. Shreiner, V.P., Info. Svcs., **48**
Lancaster Colony Corp., Sally Evans, Mgr., Office and Personnel, **50**
Leggett & Platt, Inc., Don LaFeria, V.P., Mgmt., Info. and Office Svcs., **52**
Levi Strauss Associates, Inc., Bill Eaton, CIO and Sr. V.P., **48**
MAPCO, Inc., J. Chris Scalet, V.P., IS, **17,26,48**
May Department Stores Co., Wayne Berger, Regional V.P., **52**
MBIA, Inc., Jeff Kostiw, V.P. and Mgr., IT, **17,48**
MGNA Corp., Ronald Davies, Vice Chairman and CTO, **52**
McDonald's Corp., Carl Dill Jr., V.P., IS, **20,50**
Medtronic, Inc., Thomas E. Morin, V.P., Corporate Svcs., **48**
Merck & Co., Charles Popper, V.P., Corporate Computer Resources, **48**
Merrill Lynch & Co., Edward L. Goldberg, Exec. V.P., **33,48**
Morgan Stanley Group, Inc., Mari Jane Magliaro, Director, Employee Relations, IT, **46**
NALCO Chemical Co., Mark Lega, Director, IS, **34,50**
Newell Co., Clarence Davenport, V.P. and Treasurer, **50**
Newmont Mining Corp., Jean-Michael Rendu, V.P., Mine Engineering and IS, **48**
Nike, Inc., Bob Kreinberg, CIO, **50**
PaineWebber Group, Inc., Robert McKinney, CIO, **52**
Praxair, Inc., Tom Mantz, CIO, **48**
Raytheon Co., Bob Turcotte, **48**
Reader's Digest Association, Inc., Kenneth A. Nelson, V.P., MIS, **20,34,52**
Reebok International Ltd., Tom Trainer, CIO and V.P., **50**
Rhone Poulenc Rorer, Inc., Jeff Keisling, Director, U.S. IS, **52**
Rockwell International Corp., James Sutter, V.P. and General Manager, **25,50**
Rubbermaid, Inc., Michael Naylor, Sr. V.P., Technology, **48**
Salomon Brothers, Inc., Peter Bloom, Mg. Director, Business Technology, **20,48**
Schering-Plough Corp., Robert S. Lyons, V.P., **48**
Sigma Aldrich Co., Alan M. Jaggie, V.P., Info. Svcs., **55**
Sonoco Products Co., Bernie Campbell, V.P., IS, **20,26,52**
Southwestern Bell Corp., Richard Deitz, V.P., Info. Svcs., **50**
Stewart & Stevenson Services, Ernie Trozzo, Director, MIS, **52**
Sunbeam-Oster Co., Robert Gaynor, Director, MIS, **48**
Thiokol Corp., Brad Stout, CIO and V.P., IS, **25,50**
Travelers Corp., Richard E. Morrison, Sr. V.P. and CIO, **50**
Tribune Co., John Kazik, Sr. V.P., IS, **10,38,52**
Turner Corp., David Furth, Manager, IS, **52**
U.S. Healthcare, Inc., Richard Castor, CIO and V.P., **17,48**
Unifi, Inc., Jerry Moore, V.P., MIS, **10,13,26,48**
United Healthcare Corp., James P. Bradley, CIO and Sr. V.P., **34,48**
Upjohn Co., Jack Longman, V.P., MI and DS, **52**
UST, Inc., Donald Cerullo, V.P., Corporate MIS, **17,46**
Valspar Corp., Jim Johnson, Director, MIS, **50**
W. M. Wrigley Jr. Co., Dennis Mally, Director, Info. Svcs., **48**
Wal-Mart Stores, Inc., Randall Mott, CIO and Sr. V.P., **52**
Walt Disney Co., Sharon Garrett, CIO, **48**
Waste Management, Inc., Bert Young, V.P., IS, **8,48**
Werner Enterprises, Inc., Kirk Hooten, Director, MIS, **52**
Worthington Industries, Inc., Bill Miller, Mgr., Corporate IS, **48**

Comment

Lessons of the productivity **paradox**

STEPHEN ROACH

Emotions run high at the mere mention of the fabled productivity paradox. Just the hint that computers haven't delivered their long-promised payback has sent shock waves up and down high-tech America.

And with good reason. Such a profound challenge goes right to the heart of the supposed miracles of information technology.

It must be a measurement problem, the critics say. Surely technology has always been of great value but undoubtedly in ways that are escaping the U.S. government's economic accounting system. Fix the metrics, and presto! The paradox would vanish.

That, in fact, was a key conclusion of a three-year study conducted under the auspices of the National Academy of Sciences and recently published in a volume entitled *Information Technology and the Service Society: A Twenty-First Century Lever*. As a member of the committee that produced this tome, I can attest to the fact that the measurement critique found many a sympathetic ear in our debates.

In its simplest form, the paradox went like this: America's vast service sector — industries such as banks, airlines, telecommunications and retail that collectively own about 85% of the nation's installed base of information technology — was stuck in a quagmire of disappointing productivity growth.

In the 1980s, this segment of the economy upped the ante on technology, spending an additional $860 billion on hardware alone. At the same time, however, service sector productivity failed to respond, continuing to increase at an anemic 0.7% average annual rate. The widely presumed benefits of the Information Age were starting to ring hollow.

From the beginning, I never felt this was a statistical fluke. Yes, the measurement pitfalls of gauging service sector output are legendary. But something more powerful was at work. Sheltered from competition by regulation and the lack of foreign players, service companies were becoming more complacent about matters of cost control and were loading up on both workers and machines.

The result was a bad case of bloated costs, highlighted by a rapidly growing infrastructure of unproductive information technology.

The moment of truth came with a sea change in the competitive environment. Triggered by deregulation and globalization, a massive wave of service sector restructuring began in the early 1990s, sparking unprecedented upheaval in America's technology user community. The harsh reality of service sector restructuring suggests there was something to the paradox all along.

But that was then. Courtesy of restructuring, America is beginning to move to the other side of its technology quandary. As service industries scramble to survive in today's competitive climate, they are finally using information technologies as strategic tools for competitive advantage.

Moreover, salespeople are being empowered with potent point-of-sale computing devices, enabling them to participate in higher-value activities such as inventory control and customer feedback. Additionally, a whole layer of midlevel, paper-shuffling managers is being replaced by the combination of global telecommunications networks and on-line transaction tracking systems.

And so the saga comes full circle. The paradox served the very useful purpose of signaling that something was amiss as America leapt headlong into the Information Age.

But now managers are left with the arduous task of resolving the paradox. That means adopting technology-based strategies aimed at flattening corporate bureaucracies, restoring flexibility to cost structures and providing the long-awaited boost to white-collar productivity. Let memories of the paradox endure, however, as a warning of how easy it is to stray from the path. □

Roach is co-director of global economics at Morgan Stanley & Co.

photograph by PACH BROTHERS

Adobe on Sun. Picture it.

Combine Photoshop with the power of a Sun workstation and watch your productivity fly

Five times faster than on a Power Mac. For proof, call 1-800-426-5321 ext 840 Sun

WHAT CAN PULL YOUR ENTIRE BUSINESS TOGETHER?

True network computing. It is the computing you've wanted all along: It is servers with mission-critical level security. It is servers that serve more quickly and cost-effectively: for the workgroup, department, or enterprise. It is desktops and servers with networking designed-in. It is a software environment with networking designed-in. It is an operating environment so mature financial institutions move trillions of dollars on it. It is experience that comes from selling more UNIX systems than any other company. It is the Solaris® software environment, SPARCstation™ systems, SPARCserver™ systems, SunNet Manager,™ and 16,000 UNIX experts. It is happening in businesses around the world. And it is demonstrably better. Let us prove it to you: call your nearest Sun representative.

Sun

The Network Is The Computer

© 1994 Sun Microsystems, Inc.

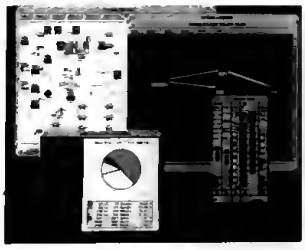
Can you get to the next generation of smart networking without scrapping the old one?

With Chipcom,® you can.

Right now, lots of vendors are selling next-generation smart switching hubs. But they all have one minor problem: What they sold you before won't work with their new technology.

With Chipcom, it's a different story.

Because to us, all this new technology is technology we pioneered years ago. We've been building switching hubs as long as we've been building hubs. So if your network has been built around Chipcom products, you've already bought a big chunk of its future. And whatever technology that future will require.



ONdemand™ NCS

For example, if you're running a network on our ONline™ System Concentrators, and you need to upgrade all or part of it to our next-generation ONcore™ Switching System, there's no problem. Every ONline module is completely upward-compatible. So not only do you save substantially by not scrapping your existing modules, you can upgrade where and as needed.

And unlike hub makers who grew up struggling with departmental LANs, vast enterprise-wide networks don't faze us. We started out building connectivity devices for huge networks, so we built scaleability and comprehensive network management into our architecture right from the start.

Call us at **1-800-228-9930** for complete information on the ONcore Switching System.

Or call us at the same number to inquire about Chipcom's worldwide seminar series on enterprise-wide networking. It's being held in more than 50 locations, so call to learn where and when we'll be in your region.

SEE US AT NETWORKS EXPO, BOOTH #1214

ONcore™

ONline™

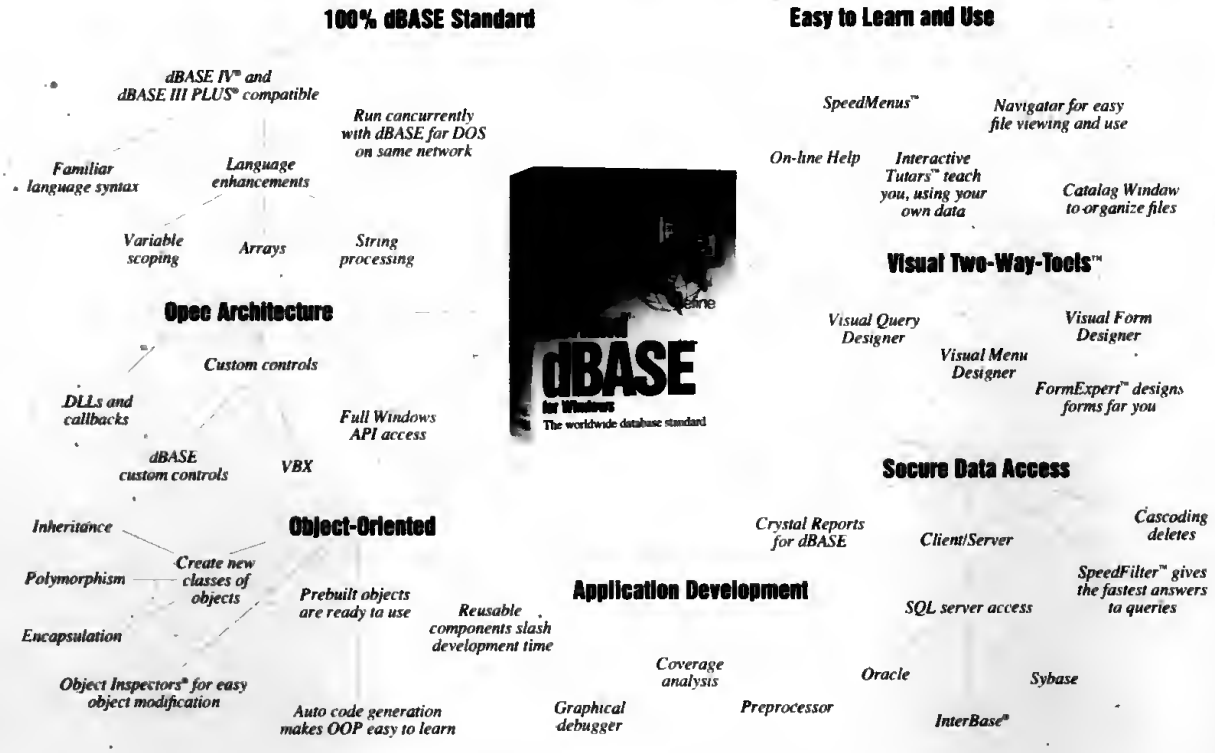
ONsemble™

CHIPCOM™

GS00K93AGS6439 The Chipcom logo, ONcore, ONdemand, ONline and ONsemble are trademarks and Chipcom is a registered trademark of the Chipcom Corporation © 1994 Chipcom Corporation, Southborough Office Park, 118 Turnpike Road, Southborough, MA 01772
Chipcom U.S. Tel: 508-460-8900 Chipcom Europe Tel: 44 (0) 494 764476 Chipcom ASEAN Tel: 60-3-283-6212

dBASE for Windows is here!

The database standard now sets the standard for Windows



dBASE® for Windows dramatically leverages the knowledge, applications, and data of the seven million dBASE users worldwide. It moves you from DOS to Windows and Client/Server in a single step. And it pioneers new levels of productivity for everyone who works with information. dBASE for Windows again sets the standard for data management and database application development.

Upgrade Now!

The best way to build Windows database applications.

dBASE for Windows	dBASE 5.0 for DOS	dBASE Training Videos
$199.95 UPGRADE	$149.95 UPGRADE NEW! VERSION	$49.95
		$49.95

FOR WINDOWS

Your path from DOS to Windows and Client/Server is here. See your dealer or CALL NOW!

1-800-336-6464, ext. 9043

FastFax 1-800-408-0001 Developer Certification 1-800-353-2211 Canada 1-800-461-3327

Borland
The Upsizing Company